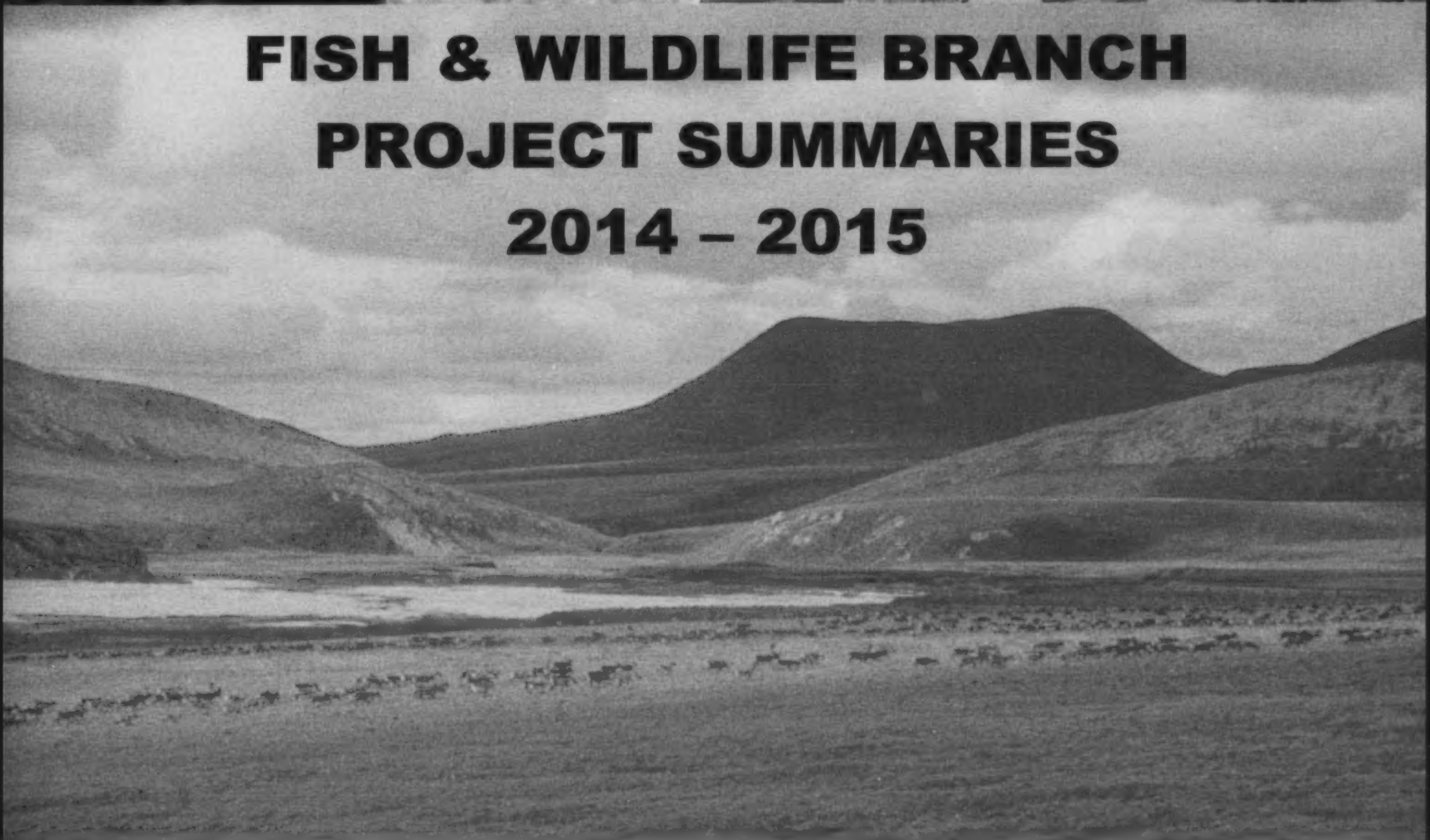
# FISH & WILDLIFE BRANCH PROJECT SUMMARIES

# 2014 – 2015



Yukon
Environment

Copies available from:
Yukon Department of Environment
Fish and Wildlife Branch, V-5
Box 2703, Whitehorse, Yukon Y1A 2C6
Phone (867) 667-5715 Fax (867) 393-6405
Email: environmentyukon@gov.yk.ca

Also available online under publications at: www.env.gov.yk.ca

# TABLE OF CONTENTS

## UNGULATES

1) Co-ordinated Moose Harvest Strategy Support: Kluane .......................... 1
2) Cumulative Effects Management Klaza Caribou Range Assessment........ 2
3) Deer Monitoring............................................................................. 4
4) Elk Monitoring and Management ...................................................... 6
5) Ethel Lake Caribou Herd Fall Composition Survey ................................ 8
6) Finlayson Caribou Herd Fall Composition Survey ................................. 9
7) Fortymile Caribou Herd Monitoring.................................................... 10
8) Klaza Caribou Herd Population and Habitat Ecology ............................ 11
9) Kluane Caribou Habitat Use, Distribution, and Population Status ....... 13
10) Kluane/Duke River Moose Census...................................................... 14
11) Kluane Region Caribou Monitoring .................................................... 15
12) Laberge Caribou Herd Range Delineation ............................................ 16
13) Novel Survey Techniques Northern Mountain Caribou ........................ 17
14) Porcupine Caribou Herd: Harvest Monitoring and Hunter Education.... 19
15) Porcupine Caribou Herd Monitoring................................................... 20
16) Porcupine - Hart River Caribou Overlap Monitoring ............................ 22
17) Sheep - Raptor Surveys in the Upper Stewart River.............................. 23
18) Sheep Survey in the Ruby Range ....................................................... 24
19) Southern Lakes Caribou Herd Fall Composition Surveys...................... 25
20) Tatchun Caribou Herd Fall Composition Survey.................................. 26
21) Tatchun Early-winter Moose Census.................................................. 27
22) Wood Bison Census......................................................................... 28
23) Wood Bison Co-operative Management ............................................. 29
24) Wood Bison Health Monitoring.......................................................... 30
25) Yukon-wide Lamb Recruitment Monitoring of Thinhorn Sheep............ 32

## HABITAT

26) Assessing Habitat Suitability for the Kluane Caribou Herd ................... 34
27) Effects of bison on late-winter sheep habitat ....................................... 35
28) Fish, Wildlife, and Habitat Planning................................................... 37
29) Habitat Protection Areas Inventory, Assessment, and Monitoring......... 38
30) Land cover mapping protocol review ................................................. 39
31) Wildlife Key Area Surveys ................................................................ 40
32) Wildlife Key Area – Sheep Data Gap Analysis ...................................... 41

## OUTREACH & COMMUNICATION

33) Aquatic Invasive Species .......... 43
34) Fish and Wildlife Communications .......... 44
35) Fisheries Education and Communication .......... 45
36) Hunter Effort Survey - Moose .......... 47
37) Marten Conservation Area- Trapping Quota Review .......... 48
38) North American Caribou Workshop 2014 .......... 49
39) Technical Reporting Program .......... 50
40) Wildlife Harvest Management Administration .......... 51
41) Wildlife Harvest Planning Coordination .......... 52
42) Wildlife Viewing: Celebration of Swans & Swan Haven .......... 53
43) Wildlife Viewing: Community Projects and Products .......... 54
44) Wildlife Viewing: Events and Information .......... 56

## CARNIVORES

45) Southern Lakes Grizzly Bear Diet .......... 58
46) Wolf: Humane Trapping Extension Project .......... 60

## FISHERIES

47) Angler Harvest Surveys .......... 61
48) Aquatic Health Monitoring for Placer Mining .......... 63
49) Fish Distribution Upper Stewart River .......... 64
50) Fish Health Monitoring & Other Laboratory Functions .......... 65
51) Fish Stocking Program .......... 66
52) Fisheries Stock Assessment and Monitoring .......... 67
53) Southern Lakes – Lake Trout Movement and Population Structure .......... 69

## BIODIVERSITY

54) Bat Monitoring and Conservation .......... 71
55) Ground Squirrel Assessment .......... 73
56) Gyrfalcon Inventory and Monitoring .......... 74
57) Impact of Climate Change on Snowshoe Hare Survival .......... 75
58) Keystone Boreal Species Trend Monitoring .......... 76
59) Species at Risk Management .......... 77
60) Wolverine Carcass Collection .......... 78
61) Yukon Conservation Data Centre (CDC) .......... 80

# Co-ordinated Moose Harvest Strategy Support: Kluane

This project funds key communication and monitoring activities needed to successfully support the Kluane/Duke moose harvest strategy.

### Project Description: What we're going to do

This work will be developed through community engagement supporting ongoing actions to ensure sustainable moose populations as recommended by collaboration partners including Kluane First Nation (KFN), Dan Keyi Renewable Resource Council and Kluane National Park.

### Management Implications: Why we're doing it

The implementation of the harvest strategy requires ongoing communication and education to increase awareness of the area's moose population concerns and to focus efforts to improve sustainability of the population. Given the shared interest in sustainable management and a commitment to sharing total harvest data by the community and KFN leadership, this project may serve as an important Yukon model for other traditional territories reviewing sustainability of moose populations.

### Project Activities: How we'll get it done

This project will support the development of communication products and ongoing education efforts to implement the moose strategy such as:

- Funding to support a community forum in which conservation messages for Kluane/Duke moose are shared.
- Communication and educational products to keep community members engaged in the conservation strategy.

**Shawn Taylor,** Kluane Regional Biologist

# Cumulative Effects Management Klaza Caribou Range Assessment

We are conducting a range assessment of the Klaza caribou herd as a pilot project to find effective approaches to support the assessment and management of cumulative effects on fish and wildlife values.

### Project Description: What we're going to do

This project builds on a recent report: *Range Assessment as a Cumulative Effects Management Tool: A Recommended Approach for Yukon Environment.* It is aimed specifically at evaluating the use of range assessments as a tool that the Branch can use to organise its technical input into environmental assessments in a way that explicitly considers landscape-scale cumulative effects of multiple developments on wildlife values. Range assessments summarise known information, evaluate risks, define management objectives, and define mitigations and management actions related to specific wildlife values. Range assessments will contribute directly to the larger Yukon government corporate framework being developed by the Development Assessment Branch for management of cumulative effects. Initial framework documents recommend that the framework be tested via a pilot project in the Casino area, a region experiencing very high levels of mineral exploration and development. This project focuses on developing a range assessment for the Klaza caribou herd in the Casino area.

### Management Implications: Why we're doing it

This program will enable the Fish and Wildlife Branch to develop a coordinated and well planned approach to data gathering and analysis using sound, science-based methods leading to effective and consistent management recommendations. It will allow the Branch to identify and assess probable responses of wildlife to multiple proposed developments at a regional scale. The information we collect is provided to the Yukon Environmental and Socio-economic Assessment Board (YESAB) to help them in their analysis of project-specific and cumulative effects.

There is relatively little information about the Klaza caribou herd and its range and the project will focus on identifying and filling data gaps, evaluating risks of present and proposed human developments, and recommending mitigations, monitoring, and adaptive management responses.

### Project Activities: How we'll get it done

Activities this year include a habitat suitability mapping workshop; a composition count; calf monitoring flights; telemetry collar replacement and monitoring, fecal pellet collection and analysis, and contract services in support of fire risk mapping and range assessment document finalization.

**Mark O'Donoghue,** Northern Tutchone Regional Biologist

## Deer Monitoring

This project will pilot a study to assess the abundance of deer in southwest Yukon. Deer are a relatively recent newcomer to Yukon, they are being hunted under permit yet there is comparatively little information on their distribution and abundance.

### Project Description: What we're going to do

This ground-based project is about using simple, non-invasive technologies, combined with innovative data analyses, to inventory and monitor deer in the Southern Lakes and Kluane regions. We will use remote cameras to collect data on the size and composition of groups of deer, information useful for harvest management and population monitoring. However, we will design the study such that we can apply an "occupancy modeling approach" to examine occupancy and detection rates in relation to habitat variables, such as land cover type and distant to roads and developments. Key winter habitats will be identified. In future, this type of study design could also allow us to quantify deer densities in the region, using novel techniques based on distance sampling.

### Management Implications: Why we're doing it

The primary impetus for this project is to provide useful information on deer populations and distribution that can inform management of their harvest and key habitats. This would be a step in meeting some of the recommendations of the Southern Lakes Wildlife Coordinating Committee.

Because deer are an important new species on the Yukon landscape, and that their population and distribution here may hinge on changes in climate, this study is one that will contribute to monitoring for the impact of climate change. Data from this study may help communities adapt to climate change (e.g. by identifying and managing key habitats for deer to ensure that they are available in the future).

In addition, this project provides an opportunity to "test drive" some new, low-cost and innovative methodologies on Yukon wildlife. If these methodologies prove useful, they may have wide applicability to other species of management interest in other regions.

Finally, camera traps capture all species within their detection cone. While the emphasis in this project is on deer, we will also gather data on the occurrence of other species (coyotes, marten or fisher as examples) that could be considered for analyses at a later date.

### Project Activities: How we'll get it done

We will place camera traps in 200-250 grid cells spanning an area east-west from Jake's Corner to Mendenhall and north-south from Braeburn to Carcross.

Camera traps will be placed in areas where there is no expectation of collecting photos of people. Cameras will remain in place at a site for a month, with mostly new grid cells sampled each month. Images (photos) will be viewed to extract relevant information to quantify deer demographics and the number of capture events in different sites/habitats.

**Sophie Czetwertynski,** Ungulate Biologist (Moose, Elk, & Deer)

## Elk Monitoring and Management

This project focuses on assessing the distribution and abundance of elk within known elk ranges. The Yukon Elk Management Plan identifies goals that include monitoring elk to determine population size, distribution, composition and survival.

### Project Description: What we're going to do

This project provides for base level monitoring of the 2 known elk. Making use of the final year of active radio-collars on these herds, elk distribution will be determined from the ground for the Takhini herd and aerially for the Braeburn herd. The Braeburn count will attempt a minimum population composition and count during fall and winter of 2015. Ground-based monitoring of animals with functioning radio-collars will continue through the season, on an opportunistic basis.

### Management Implications: Why we're doing it

Implementation of the Yukon Elk Management plan requires the review of action items and implementation of appropriate activities to meet the plan objectives. This project integrates the delivery of this plan with First Nation resource managers, local Renewable Resource Councils and stakeholder groups. The outcome of this work is that the delivery of elk management activities is coordinated, rationales are clear, and the direction for the program is supported.

Because elk ranges are situated on the urban periphery and the Ibex Valley Hamlet plan objectives have encourage increased development of land, there are continual demands for up-to-date information on the movement, distribution, and relative value of the land to elk. Monitoring elk movement and habitat use assists and supports our land use reviews for this area.

The composition of the elk herds (male or female, adult, yearling or calf) is a key variable for model estimates of population size and inform recommend permit allotments. The Elk Harvest Plan developed by the Elk Technical Team called for a reduction of the Takhini herd size to about 200 animals. Recruitment information gathered in this work will contribute to a more accurate assessment of the appropriate harvest rate on this small population. This information is particularly important now that we have transitioned from objectives of herd reduction to a managed ongoing sustainable harvest.

## Project Activities: How we'll get it done

1) The Takhini herd composition and recruitment estimates will be obtained via fall ground-based observations
2) The Braeburn herd population will be estimated from 1 fall and 1 winter aerial survey.
3) Distribution and movement patterns of radio-collared animals will be monitored via regular ground-based telemetry.

Composition and recruitment assessments for the Takhini and Braeburn herds during the fall/winter of 2013 will be used to support harvest management recommendations.

To identify annual elk distribution and movement patterns and key elk habitats we will, with support from the Yukon Fish and Game Association, periodically monitor elk on their rutting and winter range. We will also carry out aerial radio-relocation flights to maintain current information about elk distribution.

**Sophie Czetwertynski,** Ungulate Biologist (Moose, Elk, & Deer)

## Ethel Lake Caribou Herd Fall Composition Survey

This survey provides us with information to manage harvest of the Ethel Lake caribou herd.

### Project Description: What we're going to do

Recruitment into the Ethel Lake caribou herd has been chronically low since the late 1990s. Concerns about this herd led to a voluntary hunting closure that has been in place since 2002. We have closely monitored this small (300) herd with almost yearly rut counts (19 since 1993), and it is one of several herds in the Yukon that gives us long-term trend data. Before harvest of this herd can resume, the communities of Mayo and Pelly Crossing require evidence of several years of good recruitment.

### Management Implications: Why we're doing it

We will use information about recruitment into this herd to guide our decisions about when to end the voluntary hunting closure.

As part of a selected cross-section of herds this survey will contribute to an overall indicator of demographic changes in Northern Mountain caribou across the territory including responses of caribou to phenomena such as a changing climate.

### Project Activities: How we'll get it done

We will use a helicopter to survey the McArthur Range, Kalzas Twins, and ridges in between those mountain blocks, where caribou are known to congregate during rutting season (late September / early October). When groups of animals are encountered we will classify the animals into one of four categories: calves, cows, immature males or mature males.

The data will be added to the database of caribou locations and will be used to map key rutting areas for the Ethel Lake herd.

**Troy Hegel,** Ungulate Biologist (Caribou, Sheep & Goat)

## Finlayson Caribou Herd Fall Composition Survey

This survey provides us with information to manage harvest and inform land use decisions for the Finlayson caribou herd.

### Project Description: What we're going to do

The Finlayson Caribou Herd was the focus of an intense recovery program that was implemented in 1983. A late-winter census in 2007 verified what fall composition surveys had indicated – the herd had declined to almost half the number observed in 1990 at the end of 6 years of wolf control. To continue monitoring this trend, fall rut composition counts assess the status of the herd through recruitment, and indicators of population health such as bull:cow and cow:calf ratios.

### Management Implications: Why we're doing it

A recent increase in applications to develop natural resources within the herd's range has highlighted the need to have current population information to inform management decisions and recommendations to mitigate developmental impacts. Conservation and effective management of this herd is a key concern given its value as a subsistence harvest resource for the Ross River Dena Council and Liard First Nation as well as harvest interest from licensed hunters.

As part of a selected cross section of herds, this survey contributes to an overall indicator of demographic changes in Northern Mountain caribou across the territory.

### Project Activities: How we'll get it done

The survey will be carried out over 2 days in late September or early October, 2014. Surveys are conducted using helicopters flying along high alpine plateaus where caribou breeding occurs. When groups of animals are encountered we will classify the animals into one of four categories: calves, cows, immature males, or mature males. The tallies in each category are used to calculate the adult sex ratio and the recruitment rate. These ratios are standard indicators of caribou population health, which allow us to highlight potential concerns and make inferences about potential future trends.

**Troy Hegel**, Ungulate Biologist (Caribou, Sheep & Goat)

## Fortymile Caribou Herd Monitoring

This project supports aerial monitoring of the movements and seasonal distribution of the Fortymile Caribou Herd (FMCH). This information is needed to support harvest management, land use recommendations, and upcoming population and harvest management discussions in both Yukon and Alaska.

### Project Description: What we're going to do

This project focuses on deploying GPS collars on FMCH animals during the winter when they will likely be in close proximity to Dawson. The other component of this project involves assessing their summer range capacity in Alaska.

### Management Implications: Why we're doing it

Alaska Department of Fish & Game (ADF&G) has identified a concern that the herd is reaching carrying capacity on summer range. Real-time information from the satellite collars is needed to inform range assessment and harvest management decisions.

### Project Activities: How we'll get it done

Telemetry flights in association with GPS collar locations will enable locating the herd in fall and early winter to determine where Yukon range expansion is occurring and to support Alaska harvest openings and closures. We will also use collar locations to select capture locations to deploy additional GPS collars in early winter in collaboration with ADF&G.

We will assess summer range capacity by sampling vegetation from the range in conjunction with body condition sampling in the fall.

**Mike Suitor**, North Yukon Regional Biologist

## Klaza Caribou Herd Population and Habitat Ecology

This project will provide information needed about the population and habitat ecology of the Klaza caribou herd prior to more advanced development within its range. This information will serve as a baseline and will support inputs to Yukon Environmental and Socio-economic Assessment Board review processes.

### Project Description: What we're going to do

The project is taking place within the range of the Klaza caribou herd, west of Carmacks. This year a number of population monitoring activities (composition surveys, calf survival monitoring, adult female mortality assessments) will occur during key life cycle stages. Movement and distribution information will be acquired by downloading data from GPS radio-collars placed on female caribou in the herd.

We will assess the accuracy of a land cover classification that was developed for the Dawson regional land use planning process. Data collected during flights over the Klaza area and all available high resolution imagery will be used to formally validate the classification or make any necessary corrections.

Human activities and natural disturbances (e.g. fire) on the land have been shown to influence the distribution of caribou. To support our assessment of range and habitat use, recent high resolution satellite imagery will be used to map linear and planar (non-linear) anthropogenic surface disturbance.

### Management Implications: Why we're doing it

Information from this project will inform environmental assessment reviews for industrial activity in the Klaza herd's range.

The results of the population assessment will also inform harvest management decisions, as the Klaza herd is currently under a Permit Hunt Authorization regime.

The presence of GPS radio collars in this herd provides the opportunity to validate our calf: cow recruitment rates for their accuracy, based on a comparison of calf survival monitoring of known animals. This is valuable as calf: cow ratios are one of Environment's key monitoring metrics for northern mountain caribou and we rarely have the opportunity to evaluate them. Having collared caribou also allows us to measure our ability to detect animals on the landscape. This is important information for the development of a long-term monitoring plan for assessing the herd's abundance once collars are no longer present on the herd.

**Project Activities: How we'll get it done**

This is year 3 of a 5-year project. Project activities for the 2014-2015 fiscal year include:

- Ongoing collection of GPS radio-collar locations from collared caribou.
- Periodic monitoring of calf survival via aerial monitoring of GPS collared caribou. These monitoring flights will take place in early June, October, and late March.
- Retrieve GPS radio-collars emitting a "mortality" signal.

**Troy Hegel,** Ungulate Biologist (Caribou, Sheep & Goat)

**Heather Clarke**, Habitat Biologist

## Kluane Caribou Habitat Use, Distribution, and Population Status

This project will provide information on the Kluane caribou herd, one of the smallest caribou herds known in Yukon. Small caribou herds have a relatively higher risk of disturbance or decline where there is development in their range.

### Project Description: What we're going to do

Due to its small size, the Kluane herd is afforded a higher degree of monitoring in the National Northern Mountain Caribou Management Plan. Mineral exploration in the herd's spring and summer range is increasing and there is concern that the current spatial data on the herd's distribution is outdated (the most recent telemetry data for the herd is 10 years old) and may not adequately, or accurately, inform the environmental assessment process for any YESAB reviewed projects. This project will provide accurate information on the seasonal distribution and population characteristics of the Kluane caribou herd.

### Management Implications: Why we're doing it

Data from the radio-collars will directly inform the environmental assessment process by providing more accurate and up to date information on the distribution of the herd, including critical areas and/or movement corridors. This may be particularly relevant for the Kluane herd as it crosses the Alaska Highway as it moves from its winter to summer ranges.

Given the small size of this herd, the level of acceptable risk associated with any development may be reduced. Improving the understanding of herd distribution will allow Environment Yukon staff to provide meaningful guidance and recommendations to YESSA project submissions. Updated information on the size of the herd will also contribute to the level of acceptable risk related to industrial development and/or harvest. Information related to calf survival will be used to potentially identify those landscape and habitat features influencing this important demographic parameter.

### Project Activities: How we'll get it done

This is a multi-year project (year 2 of 4) operating from March 2014 thru to August 2017. Year 1 consisted of animal capture and collaring (March 2014). Location data from the collars will be obtained during the subsequent 3.5 years, with collars programmed to release and drop off during the summer of 2017. Periodically throughout the year (May/June, October, March), radio-collared females will be tracked via helicopter to determine calf presence. In the 2014-15 fiscal year the deployed collars will be used during a mark-resight survey to estimate the herd's size during late-winter (March 2015).

**Troy Hegel**, Ungulate Biologist (Caribou, Sheep & Goat)

## Kluane/Duke River Moose Census

A robust population estimate is needed to inform moose harvest management in the Kluane/Duke River Moose Management Unit. A census done in 2011 suggested that moose density is low, and the 5-year average total harvest rate is estimated to be more than twice the estimated maximum sustainable harvest rate. However, confidence in the survey results is poor, and an updated assessment of the population is needed.

### Project Description: What we're going to do

We will obtain moose population estimates in the Kluane/Duke River and Koidern Moose Management Units. We will also estimate recruitment (the number of calves), another important piece of information needed to determine a level of harvest that would allow the population to recover.

### Management Implications: Why we're doing it

Moose in Yukon are managed to maintain naturally-regulated densities *(Yukon Environment Moose Management Guidelines)* and available information strongly suggests that moose densities in the Kluane/Duke River Moose Management Unit are below this recommended guideline. Determining the biologically appropriate harvest level based on a current accurate population estimate is crucial for effective population management and recovery.

### Project Activities: How we'll get it done

In partnership with Kluane First Nation and Kluane National Park, we will conduct a census of the moose population in the Kluane/Duke River area in November. We will use a new model-based survey design that will allow us to incorporate expert local opinion and data from the 2011 census to predict moose occurrence on the landscape, and achieve a more precise estimate than was previously possible.

**Shawn Taylor**, Kluane Regional Biologist

## Kluane Region Caribou Monitoring

Annual monitoring of the Aishihik and Chisana caribou herds provides information for harvest management. The Kluane caribou herd is very small (less than 200 animals) and is experiencing increased levels of industrial activity and land use pressures. Regular monitoring will support conservation of this herd.

### Project Description: What we're going to do

We conduct fall rut composition counts to assess the status of the herds and to measure recruitment, through indicators of population health including bull: cow and cow: calf ratios.

### Management Implications: Why we're doing it

These caribou herds have all undergone intensive recovery efforts to rebuild declined populations. Regular monitoring through annual composition counts and periodic censuses is needed to provide the information that guides conservation and management actions. Annual caribou composition counts done on select herds throughout Yukon provide an assessment or baseline condition for the status of Northern Mountain caribou in the territory.

### Project Activities: How we'll get it done

For composition surveys we use helicopters to search areas in alpine and subalpine habitats in the general area to the northwest to northeast of Haines Junction known to support caribou breeding groups for these 3 herds. All caribou seen will be classified into one of four categories: calves, cows, immature males, or mature males.

**Troy Hegel**, Ungulate Biologist (Caribou, Sheep & Goat)

## Laberge Caribou Herd Range Delineation

This project will improve our understanding of the range of the small Laberge caribou herd (LCH) and determine to what extent it overlaps with the larger Carcross caribou herd.

### Project Description: What we're going to do

Management of the LCH currently operates on an estimated herd range. This project is about improving our understanding of LCH herd range.

### Management Implications: Why we're doing it

The approved Northern Mountain Caribou Management Plan indicates that herds less than 200 animals should be closely monitored and not harvested. Currently, the Game Management Subzones overlapping much of the estimated LCH range are open to licensed hunters for bull harvest. Range delineation will be useful in assessing LCH harvest, and reviewing the regulations, as appropriate.

Detailed data on habitat use will also be obtained from the GPS collar data.

### Project Activities: How we'll get it done

Frequent satellite downloads of GPS information from 10 collars deployed in late winter 2013 provide a cost effective assessment of movement patterns and animal distribution.

**Matt Clarke**, Southern Lakes Regional Biologist

## Novel Survey Techniques Northern Mountain Caribou

Northern mountain caribou are frequently identified as highly valued ecosystem components during YESAB project reviews. This project will investigate a new survey technique that could greatly reduce the cost and lead time needed to obtain abundance estimates for certain populations of caribou.

### Project Description: What we're going to do

New population estimators have recently been developed by biostatisticians with the US Geological Survey that could greatly reduce the cost and lead time necessary to obtain abundance estimates for certain populations of sheep and caribou. Most significantly, these methods do not require any form of animal marking (e.g., radio-collars) prior to survey work. Trials of this population estimator were piloted on Caribou/Nares and Grey Ridge Dall's sheep population in 2013-14 and will be followed up with the Clear Creek mountain caribou herd this year.

### Management Implications: Why we're doing it

If successful, this approach will allow Fish and Wildlife staff the ability to rapidly and consistently estimate the size of both thinhorn sheep and mountain caribou populations without the need for marking and taking into account the imperfect detection of animals during aerial surveys. This information is often lacking in YESAB applications and will be used to strengthen environmental assessments of proposed projects.

The approach will also allow for animal abundance on the landscape to be directly related to specific habitat and landscape features, which will also be useful for assessing the impacts of proposed activities. This approach will increase Environment Yukon's ability to make sound management recommendations with respect to harvest as we will have more accurate, and potentially more numerous population estimates with which to base those decisions.

Additionally, the level of mineral exploration within the Clear Creek herd range is increasing at a rapid pace. An updated estimate of the herd's size will be valuable as a baseline for this herd for use in future YESAB assessments.

### Project Activities: How we'll get it done

This is year 2 of a 2-year project. The Clear Creek caribou survey will be conducted in late September and early October 2014. Surveys will be conducted via helicopter in which predetermined transects will be flown and animal abundance counted within 2x2 km grid cells under those transects.

Habitat and landscape variables will also be measured in those grid cells which will be related to both detectability and abundance via statistical models. An assessment of the information and the method will be conducted to determine its effectiveness.

**Troy Hegel,** Ungulate Biologist (Caribou, Sheep & Goat)

# Porcupine Caribou Herd: Harvest Monitoring and Hunter Education

This project supports the operation of a Dempster Highway hunter check station and the delivery of Porcupine caribou herd hunter education programs.

Monitoring of the Porcupine Caribou hunt in Yukon is critical to assessing the status and effectiveness of harvest management actions implemented under the Porcupine Caribou Harvest Management Plan.

### Project Description: What we're going to do

In the *Harvest Management Plan for the Porcupine Caribou Herd in Canada* (HMP), all parties committed to collecting rigorous and verifiable harvest data from their respective hunters on an annual basis. This project uses a check station on the southern portion of the Dempster Highway to document harvest and as a means to provide educational materials to hunters.

### Management Implications: Why we're doing it

Data collected by this program, when combined with knowledge of caribou abundance and age/sex ratio data collected by the PCH Monitoring Project, will be evaluated at the Annual Harvest Meeting to determine if harvest is negatively affecting the herd. Pending results, specific actions may be taken as outlined in the Harvest Management Plan and the associated Implementation Plan.

### Project Activities: How we'll get it done

If the herd's migration enables harvesters to access it from the Dempster Highway, a check station at the Dempster/Klondike Highway junction will operate for 2.5 months to record harvest and provide a contact point between Environment Yukon and active hunters. The number of caribou harvested, along with harvest data from co-management partners will be collected and summarized.

**Mike Suitor**, North Yukon Regional Biologist

## Porcupine Caribou Herd Monitoring

This project is a monitoring program that determines the abundance and health of the Porcupine caribou herd. Threats to the herd have attracted considerable international attention as the herd is highly valued by aboriginal and non-aboriginal peoples from Yukon and elsewhere.

### Project Description: What we're going to do

This project focuses on understanding herd size, composition, and health of animals along with assessing the health of the herd as a country food for residents. These measures relate directly to harvest management of the herd.

### Management Implications: Why we're doing it

Collared caribou increase rigour of all surveys including efforts to estimate the size of the population; they decrease the cost and reduce bias in surveys, and allow managers to understand where large segments of the population are at any given time. This improves knowledge of year round use of the herd's range which varies.

Results from composition surveys feed into population models and are needed to fine tune the results of population estimates. Survey results are used during the Annual Harvest Meeting hosted by the PCMB to determine herd status and therefore harvest allocation.

Monitoring of health indices and metal loads also allow wildlife managers to provide recommendations with regard to human consumption such as the advisory on consumption of kidneys and livers currently in place. To date our pilot project working with Chief Zzeh Gittlitt School in Old Crow has been tremendously successful in engaging local community members (i.e., students and school helpers) while providing a forum to increase the rigour in sample collection and scientific method in the community. Such interactions assist with community education and outreach and provide an opportunity to bridge traditional and scientific approaches to data collection.

### Project Activities: How we'll get it done

Project activities include a composition count in late winter when feasible, annual collaring of caribou, body condition monitoring and disease assessment. Composition counts are aerial surveys to assess and monitor changes in the composition of the herd. During late winter, composition counts are used to estimate over-wintering survival and recruitment of young of the previous year into the population. During the late winter field work, we will capture and deploy approximately 10 satellite and 20 VHF collars.

Blood samples from captured caribou are tested as part of ongoing monitoring of disease prevalence. Data from surveys and capture are summarized in short reports immediately following completion and distributed to members of the Porcupine Caribou Management Board.

Body condition monitoring tracks various aspects of the health of harvested caribou. Hunters are asked to submit samples from harvested caribou using provided kits and keep statistics on harvested animals such as back fat depth and their opinion of animal condition based on long term experience. In 2014 we will attempt a new method of working with harvesters to increase the sample size of indicators used at the Annual Harvest Meeting (i.e., hunters' opinions on body condition and backfat measures). Regional staff assist in collection of samples in September, and again during late winter if harvest activities are occurring. In 2014 we will continue to work with secondary students at Chief Zzeh Gittlitt School in Old Crow to expose students to the integration of community monitoring and scientific method.

**Mike Suitor**, North Yukon Regional Biologist

## Porcupine - Hart River Caribou Overlap Monitoring

This project determines whether the Porcupine or Fortymile caribou herds are within the vicinity of the Hart River herd. Based on the distribution of the herds, harvest opportunities can be adjusted by implementing emergency closures if Porcupine caribou are not found in the area along the Dempster Highway.

### Project Description: What we're going to do

The project involves a series of short aerial surveys to determine the location of the Hart River caribou herd in order to inform whether subzone closures are needed to protect this Mountain Woodland Caribou herd. A secondary objective is to map the distribution of caribou at key periods in their life history including rut, post-rut, and late winter ranges.

### Management Implications: Why we're doing it

Effective harvest regulation is critical to ensuring the much smaller Hart River herd is not over-harvested while not impacting the ability of harvesters to hunt when the Porcupine Caribou are available in the 5 subzones where the herds' ranges overlap. Data collected by the program also provides insight into this herd's rut and winter ranges. It is also part of the ongoing territory-wide caribou monitoring strategy.

### Project Activities: How we'll get it done

We will locate radio-collared Hart River and Porcupine caribou from fixed-wing aircraft 3 times; one survey will identify Hart River Caribou herd distribution in mid-October; a second flight in late October will focus on the overlap area with Porcupine Caribou, and a third flight in March will again cover the extent of the Hart River herd range. Porcupine Caribou herd movements will be monitored by satellite collar locations and aerial telemetry conducted by US Fish and Wildlife Service.

**Mike Suitor**, North Yukon Regional Biologist

## Sheep - Raptor Surveys in the Upper Stewart River

This project will provide information on sheep and raptors that is needed to inform land use decisions and assessments of cumulative effects of development in the upper Stewart River area.

### Project Description: What we're going to do

There is a very high level of recent mineral staking and exploration in the upper Stewart River watershed—this high level of exploration by multiple proponents has continued even in the 2013 slow-down of exploration activity in the Yukon. The present scope and scale of activity has led to concerns about significant cumulative effects on wildlife in an area where we have very few data on any species.

This project will gather baseline wildlife data on sheep and alpine raptors, the species most sensitive to mining exploration activity, at a regional scale in this area, so that we can better evaluate population-level effects of the combined cumulative effects of individual projects.

### Management Implications: Why we're doing it

Knowledge of important seasonal habitats used by wildlife in the upper Stewart River watershed will provide the basis for recommendations on avoiding impacts or mitigating mining activities in the region.

Key areas are used by wildlife for critical, seasonal life functions and are defined for each species or species group. The Wildlife Key Area Inventory (WKA) identifies those areas that are most restricted in availability, most valuable, or where wildlife is most vulnerable, so that these areas can receive a higher level of protection.

Data collected during these surveys in combination with other distribution data will also contribute to habitat suitability modeling.

### Project Activities: How we'll get it done

We will fly in a helicopter in June-July over suitable habitat in the upper Stewart River mountain ranges and map observations of sheep and alpine raptor nests.

We will collate baseline data on sheep lambing and summer habitats and alpine raptor nesting habitats in the areas overlapping with active mining claims, for use in environmental assessments and for the WKA database.

**Mark O'Donoghue,** Northern Tutchone Regional Biologist

## Sheep Survey in the Ruby Range

The Ruby Range sheep population has been monitored at roughly 3-year intervals since 1974 and has been considered to be a "bellwether" population representative of sheep across the territory. This project is to conduct a full sheep survey of this population, last surveyed in 2011.

### Project Description: What we're going to do

The project will involve an aerial survey of sheep in the Ruby Range to obtain information on lamb recruitment (lambs per 100 nursery sheep), sex ratio (rams per 100 nursery sheep), and ram age class distribution based on horn size. Data collected during the 2014 survey will provide information regarding the current status of the population as well as any observable trends in sheep abundance and demography observed through the survey history over the past several decades.

### Management Implications: Why we're doing it

The Ruby Range sheep population has been used as an indicator population for the status of sheep over the territory. Concerns over this population have increased in recent years with the advance of mineral exploration and the potential for disturbance to this population. Results of this survey will be used to inform environmental assessment processes and decisions on the level of acceptable risk from human disturbances. Information on the composition of the population will also be used to address any concerns related to the sustainability of the harvest on this sheep population. This survey will also support a second initiative, evaluating the validity of one or more populations being representative of Yukon-wide sheep recruitment. If the Ruby Range population does represent sheep demographics across the territory, closer attention to this population as an index to understanding regional sheep population dynamics may be warranted.

### Project Activities: How we'll get it done

A helicopter-based survey will be conducted in July 2014, focussed on game management subzones 5-31, 5-34, and 5-36, with portions of subzones 5-32, 5-33, 5-35. Observed sheep groups will be mapped, counted and classified (lambs, nursery sheep, or rams). Rams will further be classified according to horn curl size.

**Troy Hegel,** Ungulate Biologist (Caribou, Sheep & Goat)

## Southern Lakes Caribou Herd Fall Composition Surveys

The recovery of the Southern Lakes caribou have been the focus of a long-term program designed to reverse the observed decline in the Carcross, Ibex, and Laberge herds. These caribou herds are highly valued by consumptive and non-consumptive users alike and are a key species in the co-operative management of wildlife in this region.

### Project Description: What we're going to do

We conduct fall composition counts to measure recruitment and assess the status of the herds through indicators of population health such as bull: cow and cow: calf ratios, to track recovery, and to measure the effectiveness of management actions.

### Management Implications: Why we're doing it

Data collected from these surveys will allow us to track and model the recovery of the Southern Lakes caribou herds. Information collected from this monitoring and modeling will allow us to inform management actions as well the discussion with our First Nation partners, and the public, concerning potential caribou harvest. As part of a selected cross-section of herds it may contribute to an overall indicator of demographic changes in mountain caribou across the territory including responses of caribou to phenomena such as a changing climate.

### Project Activities: How we'll get it done

Surveys are conducted in Ibex, Carcross, and Laberge caribou herd ranges using helicopters to determine the composition of caribou groups in breeding areas. When groups of animals are encountered they are classified into one of four categories: calves, cows, immature males or mature males. The tallies in each category are used to calculate the adult sex ratio (bull: cow ratio) and the recruitment rate (calf: cow ratio). These ratios are standard indicators of caribou population health, which allow us to highlight potential concerns and make inferences about potential future trends.

The rut count surveys will be conducted during the first week of October 2014.

**Troy Hegel,** Ungulate Biologist (Caribou, Sheep & Goat)

## Tatchun Caribou Herd Fall Composition Survey

This survey provides us with information to manage harvest of the Tatchun caribou herd.

### Project Description: What we're going to do

We have closely monitored this fairly small (600) herd with almost yearly rut counts (19 since 1993). It is one of several herds in the Yukon that gives us long-term trend data.

Harvest of caribou in the Tatchun herd is at or above maximum sustainable levels, and the population estimate for this herd is twelve years old.

### Management Implications: Why we're doing it

We use information about recruitment into this herd to guide our decisions about herd health and setting outfitter quotas, in the absence of a recent population estimate.

As part of a selected cross-section of herds this survey will contribute to an overall indicator of demographic changes in Northern Mountain caribou across the territory including responses of caribou to phenomena such as a changing climate.

### Project Activities: How we'll get it done

We will use a helicopter to survey the Glenlyon Range, Little Salmon Range, Tummel Hills, and Tatchun Hill, where caribou are known to congregate during rutting season (late September / early October). When groups of animals are encountered we will classify the animals into one of four categories: calves, cows, immature males or mature males.

The data will be added to the database of caribou locations and will be used to map key rutting areas for the Tatchun herd.

**Troy Hegel**, Ungulate Biologist (Caribou, Sheep & Goat)

## Tatchun Early-winter Moose Census

This census will confirm if harvest levels of moose within the Tatchun moose management unit exceed sustainable levels.

### Project Description: What we're going to do

First Nation and licensed annual harvest of moose in the Tatchun Moose Management Unit northwest of Carmacks is 4-5% of our population estimate, which is above the recommended sustainable harvest level if the latest 2011 census is correct. The 2011 census was conducted in late winter because poor weather delayed a planned early-winter count. There is a strong possibility that the low numbers of moose observed in 2011 may be because substantial numbers of moose moved out of the survey area resulting in a population estimate that may be biased low.

### Management Implications: Why we're doing it

A population estimate for the Tatchun Moose Management Unit will be used to determine if present harvest levels are sustainable. If necessary, an overall reduction in harvest will be required.

Data collected during these surveys, in combination with other distribution data, contribute to habitat suitability modeling.

Knowledge of regional wildlife abundance and the distribution of important and high quality habitats will provide the foundation for developing population and habitat goals.

### Project Activities: How we'll get it done

This survey will be done in late October or November and will take about 8 days for 2 crews to complete.

**Mark O'Donoghue,** Northern Tutchone Regional Biologist

## Wood Bison Census

The 2012 Yukon bison plan tasks bison managers to reduce and stabilize the size of the herd. As a relatively isolated population it is important to ensure that we have an accurate estimate of our population to see if management actions are effective. Because of the high harvest rate, inherent small population size, and conservation status of the herd, managers need good information about bison to balance recovery, address community concerns and allow local people to benefit from the resource. The opportunity to hunt bison is a valued and beneficial resource, and requires careful management using the best available information on the Aishihik herd population.

### Project Description: What we're going to do

We will use a mark-resight population census to inventory the herd.

### Management Implications: Why we're doing it

This information will be used to calculate an Annual Allowable Harvest that meets the goals of the territorial management plan for wood bison, as described in the Yukon Wood Bison Management Plan.

### Project Activities: How we'll get it done

We will conduct a population census and composition count in July 2014. This will provide an estimated population size, as well as data on recruitment (calves per 100 cows) and adult sex ratios (large bulls per 100 cows) in the population. These data are essential for population modeling, determining an annual allowable harvest (AAH), and assessing the skew in sex ratios that may be a result of a harvest biased toward large bulls.

**Thomas Jung**, Senior Wildlife Biologist (Biodiversity)

## Wood Bison Co-operative Management

The Yukon Wood Bison Technical Team (YWBTT) develops recommendations for the management of Yukon wood bison through their meetings and provides those recommendations to the Yukon Wood Bison Management Team. This project supports the activities of the YWBTT in fulfilling their mandate.

### Project Description: What we're going to do

The primary responsibility of the YWBTT is to implement the Yukon Bison Management Plan and support Environment Yukon's adaptive management framework for wood bison. Specifically, the team recommends an Annual Allowable Harvest (AAH) of wood bison and strategies for meeting the harvest. The team also develops management plans for all Yukon populations of wood bison. Sharing information and developing communication materials are an important part of the YWBTT activities.

### Management Implications: Why we're doing it

This project enables the ongoing work of the YWBTT. The YWBTT facilitates an inclusive process among relevant management agencies and councils to make recommendations toward the adaptive management of wood bison – a species that causes concerns to communities and is the focus of a popular resident hunt.

The team is the primary forum for information exchange on bison matters among effected governments and RRCs, the Board, and relevant organizations.

### Project Activities: How we'll get it done

Representatives from the Fish and Wildlife Branch chair and participate in the 2 annual meetings of the YWBTT.

Yukon Wood Bison Management Team meetings are held on an "as needed" basis.

The team will also be developing information materials such as the Bison Banter newsletter, published in November.

**Thomas Jung**, Senior Wildlife Biologist (Biodiversity)

## Wood Bison Health Monitoring

In Yukon, it is a challenge to manage locally abundant wood bison populations in a way that provides for their recovery, as required by the federal *Species at Risk Act*. The 2012 Yukon bison plan tasks bison managers to reduce and stabilize the size of the herd. Because of the focus to use harvest as a means to manage population size and because of the conservation status of the herd, managers need good information about bison to balance recovery, address community concerns, and allow local people to benefit from the resource. The opportunity to hunt bison is a valued and beneficial resource, and requires careful management using the best available information on the Aishihik herd population.

### Project Description: What we're going to do

Activities planned for this fiscal year come from recommendations in both the management plan for this herd and the DRAFT National Wood Bison Recovery Strategy. The bison program will focus on implementing tasks in the 2012 plan, specifically:

- Collect data on the composition, reproduction, and survival of animals in the population. These data will be used to refine and update population and harvest models;
- Continue to monitor movements and distribution of bison to provide data to regional planning processes and as harvest management; and
- Investigate the impact of bison on muskrats in the area.

### Management Implications: Why we're doing it

This information will be used in the following ways, all of which are contained in the Yukon Wood Bison Management Plan and the DRAFT National Wood Bison Recovery Strategy:

- Provide data to calculate an Annual Allowable Harvest (AAH) that meets the goals of the territorial management plan for wood bison;
- Provide data to better understand the spatial distribution of wood bison and monitor range expansion and shifts in range use;
- Provide data to delineate critical habitat of wood bison, as per the federal
- Species at Risk Act;
- Describe to various audiences the success and learning outcomes from this complex reintroduction and management of a large, Threatened species in Yukon; and

- Investigate the impact of bison on muskrats in the region, identified as a key concern in the bison socio-economic study, as well as in the 2012 plan.

### Project Activities: How we'll get it done

We will replace and replenish a small sub-sample of radio-collared bison in the population and do use the radio collars to do bi-monthly radio-telemetry fixed-wing flights (April, May, July, September, November, and February) to monitor herd vital rates and distribution. We anticipate that 4 to 6 collars will require replacement this fiscal year.

In April 2014 we will conduct an aerial survey of muskrat push-ups in relation to disturbance by bison to provide initial information on the potential impact that bison may be having on muskrats in the region.

**Thomas Jung**, Senior Wildlife Biologist (Biodiversity)

## Yukon-wide Lamb Recruitment Monitoring of Thinhorn Sheep

An inexpensive method for tracking sheep recruitment (lamb survival) across the territory would enhance our capacity to monitor thinhorn sheep population dynamics in Yukon. This project will evaluate the cost effectiveness and efficacy of an approach to gathering ewe/lamb ratios as part of other existing monitoring programs.

### Project Description: What we're going to do

The project is a one year trial to estimate lamb recruitment in 5 thinhorn sheep populations across Yukon. Selected sheep populations will be surveyed as part of annual caribou herd composition surveys in the fall. The intent is to evaluate which populations can be surveyed effectively and to determine which might be considered for longer term assessment as indicators of Yukon-wide sheep trends.

### Management Implications: Why we're doing it

Data collected during this work will provide a broader level of knowledge of thinhorn sheep recruitment patterns than currently exists. This information will allow managers to predict potential changes in sheep populations across the territory based on annual weather patterns, for example. Such information could be used to manage hunter's expectations regarding future sheep availability. This information may also support environmental assessments; particularly if there have been several continuous years of poor recruitment, which may suggest a sheep population may be at a higher level of risk to industrial development or disturbance. Ultimately, this information will contribute to the overall ecological monitoring conducted by Environment Yukon.

### Project Activities: How we'll get it done

This is the test or pilot year for this project. During fall caribou composition surveys (late September to early October), selected sheep populations near monitored caribou herds will be surveyed to assess lamb recruitment. Hunters will be informed about the planned surveys so as to minimize any disruption to their hunt. The Tombstone survey will be an exception and conducted in July as no annual caribou composition surveys occur in this area.

These are helicopter-based surveys and will assess lamb:nursery sheep ratios. As rams will not be classified, we are able to keep survey duration and disturbance to a minimum. For this assessment, we will survey GMS 9-03 (Grey Ridge), 5-36 (Ruby Range), 4-03 (Ddhaw Ghro), Tombstone Park (2-23, 2-28, 2-41), and 4-46 (Mt. Mye). To calibrate/compare the fall lamb ratios to what would be observed during conventional July sheep inventories, a dedicated survey on Grey Ridge will be flown in addition to a second survey during a large scale assessment of sheep in the Ruby Range (GMS 5-36).

**Troy Hegel**, Ungulate Biologist (Caribou, Sheep & Goat)

## Assessing Habitat Suitability for the Kluane Caribou Herd

This project will produce a map of human caused surface disturbance, a necessary building block to assess caribou habitat suitability and availability.

### Project Description: What we're going to do

The project is taking place in the Kluane caribou herd range northwest of Haines Junction and is one component of a multi-year study. Satellite imagery will be used to map surface disturbance and to support an assessment of caribou habitat suitability and availability. This will complement the proposed population monitoring (composition surveys, calf survival monitoring, adult female mortality assessments), caribou movement and distribution study being conducted by Fish and Wildlife staff in 2014-2016.

### Management Implications: Why we're doing it

This project will help to establish a baseline of conditions which can be used to determine the potential impacts of industrial development in the area, and help inform how to manage these activities. Land use planning and environmental assessment rely on this type of information for informed decision making.

### Project Activities: How we'll get it done

We will acquire the imagery and contract the mapping of the human surface disturbance footprint. A determination will be made of how to classify the landscape for use in a habitat suitability or resource selection function mapping.

**Bruce McLean,** Senior Habitat Protection Biologist

## Effects of bison on late-winter sheep habitat

The effects of bison on other species are of management concern and have been highlighted in the Bison Management Plan, the Little Salmon/Carmacks Community-Based F&W Plan, and recent research. This project will help us understand if bison use of late-winter sheep habitat is reducing the amount of forage available for sheep. To do this, we will assess the biomass and availability of forage types consumed by both bison and sheep in areas where the species' ranges do and do not overlap.

### Project Description: What we're going to do

In pre-selected sites in each of the two areas, we will: 1) calculate percent cover of relevant vegetation species, 2) collect samples and calculate biomass of relevant vegetation species, 3) extrapolate forage availability across the sheep range using available land cover classification and percent cover values.

### Management Implications: Why we're doing it

This project will provide insight into the effect of bison on sheep habitat. In the Aishihik area, there is overlap between bison summer range and sheep late-winter range, resulting in the possibility of forage competition between the two species. Results will include an estimate of late-winter sheep forage biomass and availability in areas where bison do and do not occur. If bison are eating the same forage as sheep, but at a different time of year, then the ability of the winter range to support sheep may be reduced, which could eventually result in a population decline.

This study will address recommendations from the Bison Management Plan and Jung and Czetwertynski (2013). Study results will inform bison management decisions within the study area and may contribute to the conservation and management of late-winter sheep habitat and sheep monitoring initiatives.

### Project Activities: How we'll get it done

Field work will occur in late June, 2015 for 6 days and will require 2 crews of 3 people.

There will be 6 survey areas, 3 within and 3 outside the area of species overlap. To reduce observer bias, crews will alternate between survey areas with each crew sampling 3 survey areas over the 6 days. Each survey area will contain 10 transects, each with 10 randomly-selected plots. In each plot, samples of all relevant species and/or species groups (i.e. those that are eaten by both bison and sheep) will be collected to calculate biomass. Percent cover of all relevant species will also be estimated and recorded.

To verify bison and sheep occurrence, pellets/patties will be counted along 5 x 100 m-long transects in each survey area.

Biomass samples will be dried and weighed in the lab following fieldwork. Percent cover values will be used with a land cover classification (EOSD) to estimate forage availability across the study area and to assess differences between areas of species overlap and non-overlap.

**Heather Clarke,** Habitat Biologist

## Fish, Wildlife, and Habitat Planning

This project supports the development of fish, wildlife, and habitat management plans across Yukon. These plans set out goals, objectives and recommendations related to management of important fish, wildlife and habitat values. Planning is also part of Yukon government's obligations under the Yukon First Nation final agreements. These plans help prioritise department budgets and support departmental participation in federal species at risk processes and requirements.

### Project Description: What we're going to do

Fish and wildlife management plans are developed by the planning program within the Habitat Programs section. We develop plans for special management areas, species of conservation concern, and community fish and wildlife work plans. Yukon government, First Nation governments and boards and councils work co-operatively on these plans to address management challenges.

This year, our efforts will focus on community-based fish and wildlife work plans for the Na-Cho Nyăk Dun and Champagne and Aishihik Traditional Territories, and both the Pickhandle Lakes Habitat Protection Area Management Plan and Whitefish Wetlands. We also hope to finalize the Ddhaw Ghro Habitat Protection Areas in the first quarter of the year.

### Management Implications: Why we're doing it

Through these plans we help set branch priorities and provide clarity about important regional and community-based fish and wildlife management issues. These plans facilitate decision making and provide a forum for the airing and consideration of management issues. We work closely with First Nation governments, boards and councils, other Yukon government departments, non-government organizations, and the public. The dialogue and relationships developed are key for Yukon government to effectively deliver programs and set priorities.

### Project Activities: How we'll get it done

We will work with First Nations and renewable resources councils to finalize the work plans and design the final document for printing.

**Michelle Sicotte,** Fish and Wildlife Planner

## Habitat Protection Areas Inventory, Assessment, and Monitoring

This project supports inventory-related activities in Habitat Protection Areas (HPAs) for management plan development or implementation. Inventory, assessment and monitoring of wildlife and habitat values in HPAs inform management and can provide a benchmark of ecological change.

### Project Description: What we're going to do

This is an on-going, multi-year project to assess the status of HPAs through inventory and monitoring of significant fish, wildlife, and habitat values. The priorities, timelines and deliverables these project are a reflection of approved HPA plans or developed in conjunction with the HPA steering committees and their work plans. This year, our efforts will be focused in the Whitefish Wetlands and Ddhaw Ghro HPAs.

### Management Implications: Why we're doing it

During the initial phase of management planning for the Whitefish Wetlands HPA, community members identified a number of values, including whitefish and wetland interests. In addition, the area surrounding the Whitefish Wetlands is part of the Eagle Plains Oil and Gas Basin. Part of this basin will be mapped with a significant winter seismic program during the winter of 2013-2014. Inventory work will consider wetland function in the context of potential surrounding impacts and identify key habitats.

The sheep survey in Ddhaw Ghro will establish a current population estimate. Some harvest of this population of 65-70 sheep occurs outside of the HPA and it's been 11 years since the last census. A check is needed to monitor the status of this small, isolated population. Establishment of the HPA (and the former Wildlife Sanctuary) was premised on protection of this sheep population.

### Project Activities: How we'll get it done

Specific inventory field activities in the Whitefish Wetlands HPA will be recommended by the steering committee (March 2014).

We will survey the sheep population in the Ddhaw Ghro HPA by helicopter in July, 2014.

**Bruce McLean,** Senior Habitat Protection Biologist

## Land cover mapping protocol review

Regional Land Use Planning (RLUP) and Cumulative Effects Assessments (CEA), Ecological Land Classification (ELC) and wildlife habitat assessments all require accurate and effective land cover classifications.

### Project Description: What we're going to do

This project involves a thorough examination of the land cover classification method applied to the Dawson RLUP and Klaza CEA areas, 2010-2013. The assessment will identify issues and sources of error associated with the method, and provide recommendations. This entails suggesting adaptations to the current method, and a comparative assessment of alternative approaches.

### Management Implications: Why we're doing it

Existing land cover classification methods were adapted from Canadian Forest Service's EOSD program to fulfill immediate needs, with no pause for critical review. Early indications of poor accuracies associated with the current methods warrant such a review, along with exploration of select alternative methods that may produce more accurate and effective products for use in future RLUPs and CEAs.

Findings from this project will be used to establish standards and protocol for future land cover classification work. Land cover classifications derived from better methodology will lead to more accurate ELC and habitat assessment products, and ultimately improve wildlife and land management decisions.

### Project Activities: How we'll get it done

We will work with qualified specialists to define a pilot study area within the Dawson RLUP and/or Klaza CEA areas where sufficient, quality data has been previously collected and assess the land cover classification methods used, test alternative methods, .

Final deliverables will include all data derived from testing of alternatives within the pilot study area, and a report detailing the objectives, methods, and results, including an evaluation of current methods.

**Marcus Waterreus,** Habitat/Remote Sensing Technician

## Wildlife Key Area Surveys

Wildlife Key Areas (WKAs) are areas that are most restricted in availability, most valuable, or where wildlife is most vulnerable. It is important to identify WKAs so that they can receive a higher level of consideration or protection in development assessment reviews and land use planning. Wildlife key area surveys are central to ensuring that the information in the Wildlife Key Area Inventory is up-to-date and comprehensive.

### Project Description: What we're going to do

Key areas are used by wildlife for critical, seasonal life functions and are defined for each species or species group. Surveys are done at key times of year to document animal locations. These identified key wildlife areas are recorded in an extensive GIS database from which digital maps can be made for viewing or printing. These maps are made publicly available on the Environment Yukon website.

The priority WKA surveys for 2014-2015 are in the Rackla area (the Nadaleen, Tasin, and Lansing ranges); in the Teslin area; and in the Dawson area.

### Management Implications: Why we're doing it

Knowledge of wildlife key areas provides the basis for recommendations on avoiding impacts or mitigating mining and other resource development activities. Data collected during these surveys, in combination with other distribution data, can contribute to habitat suitability modeling and can assist with developing population and habitat goals.

### Project Activities: How we'll get it done

This year we will conduct several helicopter- and ground-based surveys:

- Rackla area: Sheep spring lambing combined with alpine raptor (Golden Eagle and Peregrine Falcon) nesting
- Teslin area: Sheep late winter range
- Dawson area: Sharp-tailed Grouse – spring breeding (lek sites)
- These are generally one-year projects that occur over 2 fiscal years. The process involves conducting the survey, data checking and storage, WKA analysis and mapping, and report preparation.

**Val Loewen**, Habitat Inventory Coordinator

## Wildlife Key Area – Sheep Data Gap Analysis

The Wildlife Key Area (WKA) inventory identifies and digitally captures important wildlife areas used for critical, seasonal life functions. The inventory is typically maintained through interpretation of wildlife population surveys from seasons that meet "key area criteria". While the WKA inventory is designed to cover the entire Yukon, it is not complete, because there are gaps in survey coverage, and for some areas the information is now dated. For sheep, finding and filling in these gaps specific to their key areas (i.e. winter ranges, lambing areas, rutting grounds, and migration corridors) will improve and support input to land use planning and environmental assessment processes, and ultimately preserve sheep populations and their habitat.

### Project Description: What we're going to do

We will do a gap analysis to identify priority areas with high development pressure and suspected presence of sheep key areas but where none are currently mapped. Based on the findings of the gap analysis, we will identify and prioritize locations for potential surveys at key times of year to collect animal observations/locations.

We will also interview people with expert local knowledge to augment survey information or to fill in gaps where we cannot survey due to time or budget constraints.

We will use the observation/location data (possibly in conjunction with Digital Elevation Model data) to identify sheep key areas and pertinent data will be entered into the WKA database. Ultimately, the digital data and maps generated from this data can be used for environmental assessment and general viewing.

### Management Implications: Why we're doing it

Knowledge of sheep WKAs will provide the basis for recommendations on avoiding impacts or mitigating mining and other resource development activities. Data collected during WKA surveys in combination with other distribution data can contribute to habitat suitability modeling and can assist with developing population and habitat goals.

### Project Activities: How we'll get it done

The gap analysis will be a simple GIS exercise to review existing information. We will then categorize candidate areas as (i) no WKAs, (ii) possibly outdated (e.g. 1970s-80s) WKAs, (iii) generalized WKAs from interviews, (iv) current (e.g. 1990s-present) WKAs. This assessment, along with conservation-based decision-making criteria, current and anticipated land use and/or harvest issues will be used to select areas for WKA surveys. Local knowledge interviews will also be used to identify suitable locations (i.e. those identified in gap analysis but not prioritized for a survey) to be mapped and entered into the WKA database.

**Marcus Waterreus,** Habitat/Remote Sensing Technician

## Aquatic Invasive Species

The introduction and colonization of aquatic invasive species (AIS) pose potentially serious threats to Yukon waterways. This project will help to mitigate the risk by raising awareness and understanding amongst the public whose activities are most likely to result in an accidental introduction of AIS.

### Project Description: What we're going to do

This project promotes public awareness and prevention of the unintentional introduction or spread of AIS. We will focus on two aspects, education and surveillance. For education, we will focus on targeted communications to increase the public's understanding of AIS and how to prevent introduction. We will identify and focus on facilitating and encouraging behaviours and actions that prevent the spread of AIS. We will also focus on increasing awareness in anglers and boaters: the groups that pose the highest risk of introducing AIS. For surveillance, we will conduct the first survey of AIS for baseline information and to support early detection and rapid response. We will also support public engagement through reporting of suspected AIS detections.

### Management Implications: Why we're doing it

Introduction of AIS could pose significant risk to Yukon's economy and aquatic environments. This project will help mitigate this risk by raising awareness and understanding of which activities are most likely to result in accidental introduction of AIS, and what steps can be taken to avoid AIS introduction and spread. Surveys of AIS will support early detection and rapid response.

This project builds on the 2010-2011 Yukon Aquatic Invasive Species Threats Assessment project, the 2011-2012 review of communication strategies, and a communication strategy (under review) to support a future Environment Yukon AIS strategy.

### Project Activities: How we'll get it done

We will deliver communication materials that help to raise the level of awareness of anglers and boat operators about aquatic invasive species. These materials (including signage at boat ramps, questionnaires, and online information) promote behaviours that prevent the introduction the introduction and spread of aquatic invaders. Our communication materials focus on three general behaviours ("check, drain, and clean") to reduce the risk of spreading aquatic invaders attached to recreational equipment.

To support the development of these communication materials, we will evaluate surveys to determine the current presence or absence of AIS that pose a significant threat to Yukon waters, such as Didymo, Zebra/Quagga mussels, and Eurasian milfoil/Elodea.

**Heather Milligan,** Project Biologist

## Fish and Wildlife Communications

This project co-ordinates and facilitates Fish and Wildlife Branch communication initiatives. It provides editorial support to technical staff to develop and deliver appropriate communication tools to achieve their program's conservation and management objectives.

### Project Description: What we're going to do

This is an ongoing project. We will assist in developing and producing technical and plain language reports and other materials as needed for varied audiences (public, legislature, boards, and councils), establish and maintain publication review protocols and authorizations to ensure consistency and effective information transfer to the public.

### Management Implications: Why we're doing it

Communication is central to all of the primary responsibilities of the Fish and Wildlife Branch. By producing and providing accessible, trustworthy, and useful information this project supports the meaningful participation of Yukon people in planning and decision-making processes.

This program assists with the numerous requests from the public, land claim Boards/Councils, other interested parties (Yukon Outfitters Association, Yukon Fish and Game Association, Yukon Conservation Society) including national and international organizations, for current, up-to-date information associated with Branch Programs.

### Project Activities: How we'll get it done

We will provide editorial services for technical reports directly or through contractors and support the development of non-print (web-based) reporting tools.

We will produce final roll-up of species and habitat management guidelines following collaborative reviews completed by the appropriate sections.

**Jean Carey**, Coordinator Technical Reporting Program

## Fisheries Education and Communication

This project supports public outreach with anglers and communication through publications. Education is a core component of fisheries management programs; it promotes participation, stewardship and compliance with regulations. Education is consistently identified as the first step to addressing management challenges.

### Project Description: What we're going to do

We will develop and deliver programs that educate anglers about overharvested and stressed populations as a way to decrease angling pressure without regulatory measures. This will be accomplished with signage at lakes and streams or targeted messaging about fish populations in jeopardy. Education initiatives will also focus on communicating information about regulations to improve the rate of compliance. We will also develop and deliver programs that promote angling, particularly to young people.

### Management Implications: Why we're doing it

*The Status of Yukon Fisheries* identifies the importance of public education. Education and communication are ongoing initiatives critical to effective management. An informed, engaged, and responsible angling public will benefit fisheries resources and anglers alike, and promote sustainable management and compliance with fisheries regulations. Education programs will also help engage young anglers, ensuring that angling remains a relevant activity for Yukoners into the future.

### Project Activities: How we'll get it done

The fisheries communication and education program is multifaceted; we reach out to the angling public through activities, signage where people fish, free publications, and the Environment Yukon website.

We will develop and deliver public activities including Family Fishing Weekend which promotes angling and engages young people. We will host a free special event on this weekend open to the public that provides low barrier access to fishing opportunities and highlights the Stocked Lakes Program.

Where we need to communicate to anglers about particular stocks and populations of lakes or streams as well as regulations, we will consider signage and other methods. Examples include signage at Snafu, Tarfu, Louise, and Pine lakes informing anglers about the depleted status of the lake trout population, newspaper articles, and synopsis updates.

We will ensure that fisheries publications are available and up to date. Work here includes revising publications in advance of reprinting.

These include:

- *Fishing on Yukon Time: a guide to fishing in Yukon* – provides a broad geographic look at places to fish around Yukon and provides information on commonly fished species
- *Angler's Guide Stocked Lakes in Yukon* – provides tips on how to fish stocked lakes as well as access maps, bathymetry, and information on stocking
- *Common Parasites of Yukon Freshwater Fishes* – provides information on commonly encountered parasites including whether there is a human health concern
- *Status of Yukon Fisheries* – provides a broad range of information on resource status and management of Yukon's freshwater fisheries
- *Yukon Freshwater Fishes* – provides information on each of Yukon's 33 freshwater species
- *Angler Harvest Surveys* – provide results of surveys of angler harvest on key fisheries
- *Species Assessment Reports* – provide results of population surveys on lake trout, grayling, and burbot

We will continue to provide tools to facilitate and encourage ethical and legal angling. These include promotional materials like sticker rulers for angler's boats and hats for anglers who provide information about tagged fish that they catch.

**Oliver Barker,** Fisheries Management Biologist

## Hunter Effort Survey - Moose

Hunters who purchased moose tags will be surveyed to gain an understanding of success rates, the methods they utilized, and the amount of effort they exerted.

### Project Description: What we're going to do

We will work with the Yukon Bureau of Statistics to deliver a survey. To simplify the questionnaire and analyses, we focus on hunters of different species on a rotational basis. This year, our efforts are focused on moose hunters. This information aids in understanding moose hunting practices by licensed harvesters.

### Management Implications: Why we're doing it

Survey information will be used to inform future management and harvest discussions and decisions. We can respond more quickly and effectively to management issues, either through regulation, education, or information if we have current information about hunting practices.

### Project Activities: How we'll get it done

Surveys will be delivered in early January (after hunting season closes) to all licensed Yukon resident hunters who acquired a moose seal in 2014. Hunters who have not returned a survey by early February will be called and invited to complete the survey over the telephone.

**Carol Foster**, Wildlife Harvest Specialist

## Marten Conservation Area- Trapping Quota Review

An accurate assessment of marten population abundance within the Marten Conservation Area (MCA) is needed to determine the harvest rate and assess the effectiveness of current harvest quotas. The MCA extends from the Teslin River to Kluane National Park and north to Carmacks and Aishihik Lake from the BC border.

### Project Description: What we're going to do

The program will review marten quotas in 81 Registered Trapping Concessions (RTCs) within the MCA. Harvest levels were recently summarized (FY 13/14) and a population estimate is needed to calculate a harvest rate.

### Management Implications: Why we're doing it

There has been no assessment of absolute abundance of marten since they were initially introduced to the MCA, and there has been no assessment of relative abundance since 1994. Preliminary examination of harvest levels for marten within the MCA indicates quota compliance has been low over the history of the MCA (46% of RTCs over quota at some point; 30% consistently over quota). Conservation Officer Services continues to monitor RTCs and provide permits for incidental harvest but quotas are not currently enforced and there are no limits to the number of permits issued.

An assessment of marten abundance will provide a picture as to current population levels and the effectiveness of the current quota levels or if changes to quota levels are required. There is concern that the current price of marten pelts (historic high of $150.00 per pelt) may result in an increase in marten harvest in the MCA.

### Project Activities: How we'll get it done

We will use a marten habitat suitability map to select track transect sites within the Marten Conservation Area. We will conduct the track transects at each site in early and late winter. The collected data will be used to estimate the current population size.

**Dorothy Cooley,** Harvest Coordinator

## North American Caribou Workshop 2014

Yukon will host the 15th North American Caribou Workshop in Whitehorse May 12-16, 2014. This project supports a steering committee of government, academic and industry members in hosting this workshop in Yukon.

### Project Description: What we're going to do

The Workshop will be held in Whitehorse during May 12-16, 2014. This project supports Yukon in hosting and reporting on technical and social aspects of caribou biology and management. We expect, based on recent Workshop attendances in Winnipeg and Fort St. John, and interest expressed to date, that roughly 300-350 people will register for the workshop.

### Management Implications: Why we're doing it

Hosting the North American Caribou workshop allows Yukon to learn from and exchange information with pre-eminent biologists, managers, resource users, and other stakeholders interested in caribou research, management, and conservation. This presents an important opportunity to highlight Yukon's expertise and experience in the area of caribou management and conservation. The last time Yukon held the Workshop was 1998.

### Project Activities: How we'll get it done

This is year 2 of a 3-year project, with project activities for the Workshop per se being conducted in the 2013-14 and 2014-15 fiscal years, and publication of the Workshop Proceedings taking place in the 2014-15 and 2015-16 fiscal years. During the two years leading up to the Workshop, an event planner was contracted to develop a web page, arrange on-line registrations and abstract submissions, and support the organizing committee with general conference requirements such as catering, facilities booking, advertising, and sponsorship.

**Troy Hegel**, Ungulate Biologist (Caribou, Sheep & Goat)

## Technical Reporting Program

This program works to provide Yukon people with accessible, trustworthy, and useful technical information to support their meaningful participation in planning and decision-making. To achieve this, this program coordinates and facilitates Fish and Wildlife Branch communication initiatives. It provides editorial support to technical staff to develop and deliver appropriate communication tools to achieve their program's conservation and management objectives.

### Project Description: What we're going to do

This is an ongoing project. We will assist in developing and producing technical and plain language reports and other materials as needed for varied audiences (public, legislature, boards, and councils) and establish and maintain publication review protocols and authorizations to ensure consistency and effective information transfer to the public.

We will produce, as needed, foundational reference materials that can be categorized as "Fish and Wildlife Management 101" for use by Boards, Councils, and interested members of the public. This will create an enhanced presence on the Internet and establish non-traditional avenues of information distribution, including interactive presentations and narrated slideshows, with a strong visual focus for a wide audience.

### Management Implications: Why we're doing it

This program supports the departmental objective to improve the sharing and communication of data and information. Communication is central to all of the primary responsibilities of the Fish and Wildlife Branch. By producing and providing accessible, trustworthy, and useful information this project supports the meaningful participation of Yukon people in planning and decision-making processes.

This program also assists with the numerous requests from the public, land claim Boards/Councils, other interested parties (Yukon Outfitters Association, Yukon Fish and Game Association, Yukon Conservation Society) including national and international organizations, for current, up-to-date information associated with Branch Programs.

### Project Activities: How we'll get it done

We will provide editorial services for technical reports directly or through contractors and support the development of non-print (web-based) reporting tools. The aim is to build on products previously developed in a way that is responsive to emerging issues and needs. Products produced through this program are hosted on the department Internet site. A focus this year will be providing information in support of harvest decisions.

**Jean Carey**, Coordinator Technical Reporting Program

## Wildlife Harvest Management Administration

The harvest management administration budget supports harvest management advertising, outfitter quotas and travel to communities to participate in quota and/or regulation meetings.

### Project Description: What we're going to do

Harvest management advertising promotes and communicates new management rules and provides reminders about regulations and requirements. We provide ongoing support of outfitter quota negotiations, including background material preparation and Yukon government representation at quota meetings; also Yukon government representation when required at Outfitter Quota Appeal meetings. Fish and Wildlife Branch lead with regards to *Wildlife Act* regulation changes.

### Management Implications: Why we're doing it

Harvest management advertising keeps the hunting public informed about changes to hunting regulations. Outfitter quotas are negotiated to abide by the Guidelines to Establish Outfitter Quotas. Wildlife Act regulation changes are proposed, developed and implemented, resulting from identified changes to improve harvest regulations.

### Project Activities: How we'll get it done

Timely harvest management advertising, ongoing outfitter quota negotiations and regulation changes proceeding according to agreement the Yukon Fish and Wildlife Management Board we will facilitate the regulation review process.

**Carol Foster**, Wildlife Harvest Specialist

## Wildlife Harvest Planning Coordination

This program assists in the development of harvest strategies and plans with First Nations, Government of Yukon, and adjacent jurisdictions. A collaborative approach to harvest management and harvest reporting systems addresses conservation issues and ensures sustainable harvesting.

### Project Description: What we're going to do

This program administers the continued implementation of the Porcupine Caribou harvest management plan, and will assist with new projects for coordinated moose harvest managements (for example, Southern Lakes, Duke River/Kluane).

### Management Implications: Why we're doing it

The provision of technical support and statistical advice to First Nations concerning harvest data collection will support accurate and reliable first nation harvest numbers. This information informs collaborative harvest management planning and harvest reporting and is used to address conservation concerns regarding low ungulate population numbers and reportedly high harvest rates.

### Project Activities: How we'll get it done

In collaborative processes led by regional biologists, we will

- provide available harvest data;
- assist First Nations with the development of harvest reporting systems that will provide data with sufficient rigor to make management decisions; and
- develop and provide communication products that outline biologically-based rationale for harvest management decisions and actions for use by all cooperating parties.

**Dorothy Cooley,** Harvest Coordinator

## Wildlife Viewing: Celebration of Swans & Swan Haven

The Wildlife Viewing Program (WVP) organizes and delivers the annual *Celebration of Swans*, and operates the Swan Haven Interpretation Centre. *A Celebration of Swans* takes place annually during the month of April when swan migration peaks at Marsh Lake and other open water areas. It is focused at Swan Haven Interpretive Centre at Marsh Lake, but also provides interpretive activities at Tagish, Teslin, Johnson's Crossing, and Burwash Landing. This festival provides an opportunity for alternative wildlife management practices through education and appreciation.

### Project Description: What we're going to do

*A Celebration of Swans* takes place annually during the 3rd week of April when swan migrations peaks at Marsh Lake and other open water areas. The festival reaches more than 2,000 Yukoners annually and provides curriculum-specific programming to more than 600 students. Activities are designed to reach a diverse audience of Yukoners and educate about the importance providing a safe place for swans to rest and feed on their migration.

### Management Implications: Why we're doing it

This project enhances the visitor experience in Yukon, fosters greater understanding and appreciation in residents and visitors for the natural attributes of Yukon, and increases opportunities for residents and visitors to engage in conservation and stewardship. The WVP directly supports the goals of the Environment Yukon Strategic Plan to promote environmental stewardship and share environmental information with citizens.

### Project Activities: How we'll get it done

*Celebration of Swans* events include birding tours, a family activity weekend, bird identification and photography workshops, art exhibits, storytelling, guest speakers, contests, and peaceful swan watching opportunities around southern Yukon. Activities are designed to reach a diverse audience of Yukoners and educate about the importance providing a safe place for swans to rest and feed on their migration.

2014 will be the 20th anniversary of *A Celebration of Swans* and Swan Haven. Work will begin in winter 2014 to plan a variety of educational events, celebrations, learning opportunities, and strategies to promote the successes of Swan Haven and the important wildlife management messages it carries.

**Carrie McClelland**, Wildlife Viewing Biologist

## Wildlife Viewing: Community Projects and Products

The Wildlife Viewing Program (WVP) provides opportunities for the public to learn about Yukon's environment and foster a better understanding of the natural world. Through public engagement, WVP projects directly support Environment Yukon's strategic goals of promoting environmental stewardship and sharing information with Yukoners to inspire appreciation of Yukon's environment. Opportunities to view and appreciate wildlife are an important component in fostering stewardship and respect for the natural world. Each year the WVP directly reaches an average of 4,000 Yukoners through interpretive walks and talks in Yukon communities. Many more Yukoners and visitors gain information about wildlife viewing and natural history through the suite of products available in print and electronically.

### Project Description: What we're going to do

The WVP works with community groups across the territory to highlight a variety of ecosystems and wildlife viewing opportunities while utilising local knowledge and experiences. Community directed projects allow communities to share their knowledge of local wildlife and wildlife issues with visitors and other Yukoners. Projects include trail development and maintenance, interpretive panel or brochure development, viewing platforms, information kiosks, and support for locally provided walks and talks.

### Management Implications: Why we're doing it

Creating awareness in the public and land claim public structures about wildlife viewing opportunities and biodiversity supports conservation and management programs. This project enhances the visitor experience in Yukon, fosters greater understanding and appreciation in residents and visitors for the natural attributes of Yukon, and increases opportunities for residents and visitors to engage in conservation and stewardship.

### Project Activities: How we'll get it done

To encourage stewardship, raise awareness of biodiversity issues, and develop local viewing opportunities, publications and sites are developed with partners.

- Whitehorse – Maintain existing signage in the city's *Significant Wildlife Areas,* and contribute to the development of new signage as needed.
- Dawson City –
    - Community members in Dawson have begun the construction of a natural walking trail on the bluffs above the river in West Dawson. Wildlife Viewing will partner with the Heritage Branch and work with community members to develop interpretive signage about the natural history of this area.

    - Damaged signs have been removed from the Top of the World Highway rest stop. New signage will be written and replace the information regarding the 40 Mile caribou. Planning meetings and site visits will be conducted with the regional biologist to determine messaging and additional interpretive options for education surrounding the 40 Mile Caribou.

- Mayo –
    - Maintenance of existing, and evaluation of potential, viewing sites is part of the *Community Based Fish and Wildlife Work Plan* for the Nacho Nyak Dun Traditional Territory (2008-2013).
    - Initial site work and preparation has been done at Minto Bridge between Mayo and Keno. Additional work for trail development and installing of interpretive signage planned in 2013, in partnership with Tourism and Culture.
    - Keno trails have been re-signed and re-routed to accommodate increased mining activity in the area. Wildlife Viewing will continue to work with local community members to update and maintain the Alpine Interpretive Centre and provide safe and respectful access to the alpine.
- Faro/Ross River – Continue to work with the community to improve viewing opportunities and support the Crane and Sheep Festival.
- Destruction Bay –. Partner with the RRC and community members to update their wildlife information kiosk and highlight local assets, providing opportunities for travelers passing through to learn about the area.
- Haines Junction –Partner with the Conservation Data Centre and Yukon Bird Club to update the content of the panels (including species at risk information) by the swallows' nests at the Haines Highway weigh scales.
- Carcross – Update and reprint the Wye Lake and Carcross viewing wildlife publications. These brochures will be updated and reprinted to be distributed at the local government offices and visitor information centres.
- Travel to RRCs to present on non-consumptive approaches to wildlife management; providing resources and support to RRCs to address non-consumptive wildlife management solutions.

**Carrie McClelland**, Wildlife Viewing Biologist

## Wildlife Viewing: Events and Information

The Wildlife Viewing Program (WVP) provides opportunities for the public to learn about Yukon's environment and foster a better understanding of the natural world. Through public engagement, WVP projects directly support Environment Yukon's strategic goals of promoting environmental stewardship and sharing information with Yukoners to inspire appreciation of Yukon's environment. The WVP hosts wildlife viewing events and provides Yukoners with access to wildlife information. Brochures, webpages, and presentations are effective methods of communication to reach a diverse Yukon population. The non-consumptive use of wildlife engages and inspires Yukoners to appreciate wildlife.

### Project Description: What we're going to do

Wildlife Viewing events are delivered through interpretive walks and talks and public presentations that focus on a specific wildlife topic. Events are organised within the annual Wild Discoveries summer series, and focus on a variety of issues related to wildlife management and appreciation. The Wild Discoveries series offers a venue in which Environment Yukon biologists and other researchers communicate their findings and knowledge of Yukon's wildlife to the public. The public is directly engaged with experts in the field who are able to answer questions and better inform Yukoners. The WVP also develops wildlife interpretive products such as brochures, booklets, webpages, and posters. WVP currently maintains and regularly updates more than 40 different publications on Yukon wildlife and viewing opportunities.

### Management Implications: Why we're doing it

Creating awareness in the public as well as land claim boards / councils and other bodies about wildlife, viewing opportunities, and biodiversity supports conservation and management programs. This project enhances the visitor experience in Yukon, fosters greater understanding and appreciation in residents and visitors for the natural attributes of Yukon, and increases opportunities for residents and visitors to engage in conservation and stewardship. Environment Yukon receives year-round requests for information on Yukon's wildlife and wildlife viewing opportunities.

### Project Activities: How we'll get it done

Throughout the territory, throughout the year, special events and programs, such as the *Wild Discoveries* series (since 1998), create opportunities for residents and visitors of all ages and interests to engage in watching and learning about wildlife. The major projects regarding events and information communication are:

- Wild Discoveries – this series of interpretive events continues to engage Yukoners in wildlife management issues and educate them about our natural world. Programs are delivered by WVP, with assistance from other Environment Yukon biologists and staff, from June to September, in the evening or weekends.
- Takhini Burn – the panels at this popular rest stop are undamaged but dated and in need of renewal with current information for the area. Updated panels will be designed and printed in the winter of 2014-15. Maintaining and enhancing roadside elk interpretive sties is part of the *Management Plan for Elk in the Yukon* (2008) – Goal 4, Objective 2.
- Rancheria Falls – this excellent viewing site is maintained by Parks Branch. The panels are out-dated and some are missing. The panels will be researched and written, designed, and printed, to be installed in the spring of 2015.
- Publications and print – information regarding Yukon wildlife and habitat will all be reviewed and updated as needed. Interpretation development may include a combination of website information, panel development, and printed matter.

**Carrie McClelland**, Wildlife Viewing Biologist

## Southern Lakes Grizzly Bear Diet

On a territory-wide basis, there is very little information on bear population dynamics, habitat use or other aspects of bear ecology. This project fulfils commitments for the 6th year of a 7-year study on Grizzly bears.

### Project Description: What we're going to do

This project will provide data to monitor grizzly population trend through habitat use (including dens), movement, survival, reproduction, and body condition metrics. We will also assess grizzly bear diet and habitat use, and how these relate to caribou (information obtained from collared Southern Lakes caribou) and moose (information obtained from current and historical moose survey information) distribution.

### Management Implications: Why we're doing it

The Southern Lakes grizzly bear population is suspected to be declining due to human-caused mortality. Further, suspected decreases in ungulate densities in the region may have had trophic influences on the bear population. While bear predation rates on moose have been examined, the extent to which bears rely on ungulates has never been identified. Some land claim bodies have requested information on the trophic relationship between bears and the ungulate species, specifically focusing on bear diet. Information from this study will be used to assist in the management of grizzly bears in the Southern Lakes population. This includes calculating quotas, identifying means to reduce management kills (by reducing human-bear conflicts), identifying critical habitat components and providing information critical to habitat management activities through land-use planning and environmental assessment (to reduce human-influences on bear mortality), and considering any management implications associated with ungulate/bear interactions.

This project is important at an international scale because it helps Yukon meet obligations under CITES to manage this species using the best available scientific techniques and information. This project is important at a national scale because Yukon's bear management program impacts the national non-detriment finding for this species. Consequently there is a desire to demonstrate sound management of grizzly bears to national jurisdictions.

This project also has significant local importance. Information on bear populations in Southern Lakes was recommended as a major information need through the Southern Lakes Wildlife Coordinating Committee. Bear inventories, particularly to verify the population estimates that the Fish and Wildlife branch currently use for management in this area, have been a continuing request by outfitters. Information on bear ecology and status is frequently needed for environmental impact assessments. Further, bears continue to attract significant public attention in the media.

Information needs on grizzly bears continue to be high. As a primary harvest species, and its status unknown in the Southern Lakes area, it is important to gather information specific to this population and complete an assessment.

**Project Activities: How we'll get it done**

This year, the project involves maintaining (recollaring) and monitoring existing collared bears and, when land- or aerial-based opportunistic situations arise, deploying collars on new bears. Collars provide information on bear demographics, habitat use, and survival. Opportunistic collaring utilizes situations where deploying collars requires little effort and reduced costs. Examples may include deployment of collars on sows that are associated with collared boars and are identified during telemetry flights in the spring breeding period; collaring bears that are in human conflict situations; and, collaring bears that are identified during other field projects.

Hair and fat samples will be taken from collared bears for diet analysis and to measure their body condition. Collars will provide the ability to monitor movement/habitat use, survival, and reproduction.

Hair samples collected during the past field season will be sent for DNA lab analysis. These results will be used to estimate the size of the grizzly bear population. Acquiring the population size will also assist with determining needs for population trend monitoring in the future. The population size and trend are fundamental pieces of information needed to make management decisions.

Field work for the 2014 project year will be conducted from May to October.

**Ramona Maraj**, Carnivore Biologist

## Wolf: Humane Trapping Extension Project

This project supports Environment Yukon in working directly with trappers to provide hands on training and support, advance community trapping interests, and promote an industry approach to trapping that is done in a respectful and humane manner.

### Project Description: What we're going to do

This project supports the wolf program coordinator in working directly with Yukon trappers both individually and collectively as part of a trapping community in efforts to educate and support wolf trapping initiatives. The program coordinator will collaborate with individual trappers, one on one or will coordinate with knowledgeable and skilled trappers to support local communities in their interest in improving wolf trapping knowledge and success.

### Management Implications: Why we're doing it

This project supports meeting the goals/ objectives and recommended implementation measures of the 2012 Yukon Wolf Conservation and Management Plan. It also is important in demonstrating sound resource management practices around the harvesting of wolves. Individual trappers and communities with strong interest in management of local wolf populations see an increased wolf harvest as a means to achieve short term benefits on local prey populations. We work with local trappers to improve capture efficiency and to reduce suffering of wolves caught in snares and in doing so demonstrate sound and respectful resource stewardship and management.

### Project Activities: How we'll get it done

We will engage with trappers, Renewable Resource Councils (RRCs) and First Nations to review local perspectives and considerations on implementation of the Wolf Conservation and Management Plan. Supported by the plan, the Wolf program coordinator will work with individual trappers on traplines to demonstrate snare preparation and setting techniques. We will also conduct smaller focused workshops in communities and on the land to with small groups of trappers to improve coordination of community trapping initiatives, and increase familiarity with humane trapping tools and methods.

**Peter Knamiller,** Coordinator, Wolf Management Program

## Angler Harvest Surveys

Angler harvest surveys provide key information for fisheries management decisions and actions in Yukon. We are doing this project to understand how angler harvest compares to estimates of lake productivity. This project supports hiring contract technicians to conduct face to face interviews at the key sport fishing lakes.

### Project Description: What we're going to do

Each year, we conduct angler harvest surveys on several high-use recreational fisheries in Yukon. The primary goals of these surveys are to determine angler effort, catch rates, harvest, and to gather biological data from fish harvested by recreational fisheries. Results of these surveys will be compared with past results to determine trends in the fishery and the sustainability of the current level of angler harvest. Priority areas for 2014 include Kusawa Lake and one of the Southern Lakes (Marsh, Tagish, or Bennett lakes; Tagish or Nares rivers - to be determined). As part of this project, we will also provide science overview, direction and data analysis and support to an angler harvest survey of Atlin Lake being supported/ led by Yukon Parks.

### Management Implications: Why we're doing it

Kusawa Lake has been identified by management agencies as a lake where harvest concerns exist. The most recent survey of Kusawa Lake angling was in 2006, when we documented increasing effort, declining catch per unit effort (CPUE) for lake trout, a decreasing size in lake trout retained, and harvest at 63% of Optimal Sustained Yield (OSY). All of these findings indicate the beginnings of a possible overharvest issue. Results from the angler harvest survey will be analyzed with data from a concurrent lake trout survey to provide a full understanding of population and harvest.

The Southern Lakes support the largest amount of sport fishing effort in Yukon. Management of this system has long been a priority for YG and the Carcross Tagish First Nation (CTFN). We have conducted angler harvest surveys at 4 different locations in the Southern Lakes in past years and survey results suggest harvest may be high in some portions of the system. It is important to maintain current and reliable information on these very important fisheries.

The timing of updating the angler harvest survey data for the Southern Lakes is tied to the project currently underway to study the movements and population structure of lake trout across the Southern Lakes. We hope to conduct an angler harvest survey (and a population assessment) on a different location in the system each year of this project. These surveys will also provide genetic samples from angler-caught fish. The samples will help us to understand the genetic structure of lake trout stocks and subpopulations in this lake system. It will also help understand which subpopulations are being most heavily (or disproportionately) exploited. The surveyor will also provide information on the project to anglers, solicit cooperation, and ensure that we are getting as much value as possible out of the existing effort and harvest data collection activities.

## Project Activities: How we'll get it done

A field worker, under contract with Environment Yukon, will conduct face-to-face interviews with anglers on selected sample days throughout the summer. The surveyor will ask a standard set of questions about the social and biological aspects of the fishery, such as the time spent angling and the species and number of fish caught. Data from these surveys will be entered, analyzed, and reported on.

**Aaron Foos**, Fisheries Technician

## Aquatic Health Monitoring for Placer Mining

This project, when combined with Yukon Energy, Mines and Resources' (EMR) Water Quality Objectives monitoring and Economic Health monitoring, informs the Yukon Placer Secretariat's adaptive management process. The system is of great importance in affording sufficient protection to freshwater fish (and salmon) and their habitats. This project supports Environment Yukon participation and support of Yukon's commitment to the adaptive management process.

### Project Description: What we're going to do

This is an ongoing project to monitor how placer mining activities are affecting run-off water and stream organisms to ensure established standards are appropriate. Field work primarily takes place in placer-mined watersheds in coordination with the federal Department of Fisheries and Oceans (DFO) and Yukon Energy, Mines and Resources. Forty sites are sampled annually. The final selection of these sites takes place at a coordination meeting each spring. Data gathered is shared to support regulatory decisions made under the Placer Regime.

### Management Implications: Why we're doing it

The 2003 Record of Agreement commits the Yukon government, Council of Yukon First Nations and DFO to develop and implement a new regime for placer mining and its impacts on fish habitat. Yukon government and DFO are jointly responsible for carrying out Aquatic Health Monitoring, and Environment Yukon has been requested by EMR – Placer Secretariat to assist with this task. Through this process, decisions are made to change or modify effluent discharge standards for placer mining to maintain and protect the health of Yukon aquatic environments.

### Project Activities: How we'll get it done

This is an ongoing project. Field work protocol is detailed in the Yukon Placer Secretariat Watershed Health Monitoring Protocol. In a typical year, Environment Yukon will sample 15 sites by helicopter and 5 sites will be sampled by boat / road access.

Field work is done between July 15 and August 7 each year so that sampling of aquatic benthic macroinvertebrates is done consistently. When the field data collection is complete the benthic insect samples are analyzed by an expert in this field. When the data are available, we will assess each site we visited to determine whether the aquatic environment is healthy or not.

Results of the monitoring will be communicated through the Yukon Placer Secretariat in the Annual Monitoring Report.

**Aaron Foos**, Fisheries Technician

## Fish Distribution Upper Stewart River

This project expands upon the existing wildlife baseline data collection program of 2012-2013 and addresses a gap in fisheries and aquatic health information. There is a high level of mineral exploration in the upper Stewart basin and concern about significant cumulative effects from this and potential future activities. The remoteness of the area means that far less is known about fish and wildlife values at stake.

### Project Description: What we're going to do

We will develop a computer model of aquatic health and fish distribution and abundance focusing on freshwater fish. The output will then be compared to the existing placer mining-related model for the upper Stewart watershed to detect similarities and differences. The goals of this project are to provide an enhanced understanding of aquatic resources within the Rackla Gold study area as follow up to the work done in 2012-13.

### Management Implications: Why we're doing it

For industries and land use interests (other than placer mining), site-specific fish and aquatic health information is needed to inform environmental assessments. A determination of potential effects is based on what fish species are present. In many areas of Yukon, there is little information available, thus requiring a specific field study to be carried out. This project will identify important freshwater fish values in the Upper Stewart watershed to ensure these are captured in assessment of any development.

### Project Activities: How we'll get it done

This project involved the collection of fish and benthic organisms, measuring the physical and chemical parameters of water and sample site characteristics. All of the information will be used to generate a computer model that can be used to predict the distribution of fish in the watershed.

**Nathan Millar,** Senior Fisheries Biologist

## Fish Health Monitoring & Other Laboratory Functions

Healthy fish contribute to the health and sustainability of fish populations. This program supports our ability to monitor fish health and to provide quick feedback to the public if concerns arise about fish disease or parasite issues.

### Project Description: What we're going to do

This is an ongoing program that includes conducting laboratory analyses of fish and other fish-related biological specimens as well as participating in sampling of fish for contaminant levels. We will also coordinate aquatic animal health activities (including disease screening for introduced and transferred fish) and identify fish diseases and parasites.

### Management Implications: Why we're doing it

The Yukon public expects us to maintain a system to monitor fish populations in order to detect any problems as they arise. This project also supports our ability to provide quick feedback to the public if concerns arise about fish disease or parasite issues. Ongoing monitoring contributes to the safety of fish stocks through the maintenance of appropriate screening processes.

### Project Activities: How we'll get it done

We examine diseased fish turned in by the public or caught in netting studies. Some work will focus on areas and stocks that have been identified as having potential or actual disease or parasite problems.

We will continue to collect and examine stomach contents of 250 – 500 fish annually. Stomach content data will be incorporated into reports on fish populations where appropriate.

We will monitor the health of hatchery-raised fish at the Whitehorse Rapids Fish Hatchery through disease screening to ensure that no diseased fish are released into the wild.

We will coordinate the collection of samples and their analysis for contaminants and communicate results to the public (in part through annual updates to the Fisheries Synopsis) and will continue to participate on the Yukon Contaminants Committee.

Disease information will be incorporated, as necessary, into the Common Parasites of Yukon Freshwater Fishes publication. Information will also be provided directly to the public when concerns are raised or fish with health problems are submitted for inspection.

**Oliver Barker,** Fisheries Management Biologist

## Fish Stocking Program

This program creates and maintains fishing opportunities for Yukoners and visitors alike at stocked lakes throughout the territory. This project ensures that lakes supported under the program continue to have a supply of fish, hence fishing opportunity, for recreational anglers.

### Project Description: What we're going to do

Suitable pothole lakes are stocked on a rotating basis, providing easily-accessible fisheries that are particularly attractive to families and first-time anglers. This program also involves an educational component, including interactive programs on lake stocking, angling pressure and responsible angling practices.

### Management Implications: Why we're doing it

Wild stocks of fish in Yukon are slow-growing and susceptible to overharvest if subject to un-regulated fishing pressure. Possession and catch limits are more liberal on stocked lakes. Providing alternative angling opportunities close to population centers alleviates some of the fishing pressure from wild stocks, without requiring more restrictive angling regulations.

The maintenance of the stocking program (currently 20 lakes across Yukon) provides a tremendously important set of opportunities for Yukon anglers: over 20% of resident anglers fish the stocked lakes and Yukoners spend over 6700 days angling in stocked lakes each year (Survey of Recreational Fishing in Canada 2005). Over 90% of Yukon anglers surveyed said that the Stocked Lake Program was 'very important' or 'important' to them (Survey of Recreational Fishing in Canada 2005).

### Project Activities: How we'll get it done

This is an ongoing program, with a stocking rotation that ensures continued viable fisheries at stocked lakes across the territory. In 2014-2015, Haldane, Hidden 1 and 3, Judas, Long, Marcella, Salmo, and Wrong lakes are due for stocking. These lakes will be stocked in late May – early June with rainbow trout and kokanee salmon from Whitehorse Rapids Fish Hatchery, augmented with rainbow trout fry imported from disease-free sources outside of Yukon. Fry transportation and release will be coordinated among Fisheries and Regional staff, as well as volunteers from Yukon Fish and Game Association.

This program will also deliver an interactive Hidden Lakes Fry Release public event in Whitehorse in late May, a very popular event, particularly among families with young children.

**Oliver Barker,** Fisheries Management Biologist

## Fisheries Stock Assessment and Monitoring

Stock assessments are one of the basic information needs that support fisheries management decision making. They provide the data needed to develop estimates of harvest potential and to support management strategies that are used to avoid or address overharvest situations. They provide the insight that ensures that management approaches are properly supported, from education campaigns to regulatory amendments, and allow the department to evaluate the effectiveness of our fisheries programs. Stock assessments are the major source of long-term fisheries data and are collected in a systematic and consistent fashion year after year.

### Project Description: What we're going to do

This is an annual program. Field work begins in May and generally extends through the open water season as determined by fish life history, water temperature, and logistical constraints. Where appropriate, stock assessment data are used in conjunction with other data (e.g. angler harvest survey data) to develop management strategies for waterbodies and fish populations of interest. We will develop reports and other communications materials (e.g. presentations, posters) for communities as appropriate or required.

Specific project priorities are identified in conjunction with Regional Programs, First Nations and Renewable Resources Councils, community-based and area-specific plans and the Status of Yukon Fisheries, which identify and prioritize fisheries of particular concern.

Field activities vary based on the type of monitoring needed. Based on the level of risk (as outlined in the Status of Yukon Fisheries) netting studies, mark-recapture evaluations, telemetry studies, or other assessment methods are conducted, and focus on heavily-harvested species such as lake trout, Arctic grayling and burbot.

### Management Implications: Why we're doing it

These surveys are the base data used in assessing the state of the fisheries resources and are used to make management decisions. Ongoing and regular evaluation of important stocks is necessary to detect and respond to changes in a timely manner. The information collected in this work allows the department to manage fish resources, to maintain healthy fish stocks and sustainable harvest opportunities, to assess the status of fish stocks, and to monitor changes over time that may be occurring due to anthropogenic (e.g., harvest) and environmental factors (e.g., climate change).

## Project Activities: How we'll get it done

We use the summer profundal index netting (SPIN) method for assessing key populations of lake trout and whitefish. This method uses stratified random gill net sets to capture lake trout and whitefish, and provides estimates of lake trout density and abundance (as well as relative abundance of whitefish). We will carry out SPIN surveys on Kusawa, Little Salmon, Simpson, Bennett, and Upper Snafu lakes. Lake trout assessments of these lakes are supported by planning objectives, RRC and First Nations engagement, conservation concerns outlined in Status of Yukon Fisheries, and method development priorities.

We continue to develop our assessment method for Arctic grayling populations. Surveyors wearing drysuits and snorkel gear swim streams and visually count grayling. The proportion of the total grayling population sighted by snorkellers is estimated using sightability models for Yukon streams. Surveys produce estimates of grayling density and provide grayling habitat assessments. We will continue method development and monitoring at Lubbock River, an important spring grayling fishery. This year we will expand the use of this method to other waterbodies to develop a broadly applicable technique.

We will continue to develop out burbot mark-recapture method as we balance short term management information needs and long-term model development for broad scale management of burbot. We will focus on burbot in Kloo Lake and will assess burbot abundance, condition, growth, and health.

We will continue our work towards an updated and revised understanding of Yukon lake productivity based on physical and chemical measures. Estimates of sustainable harvest for each lake are based on lake productivity parameters; updating these methods to reflect the most recent data and best available science will improve our ability to effectively manage Yukon's freshwater fisheries. Following up on last year's work, we will fill in geographic gaps in our lake productivity sampling program with the goal of spatially modeling lake productivity. We will also focus on the planktonic component of productivity – moving from an understanding of nutrient availability to the biological underpinnings of fish production. We will review literature for the more appropriate methods for this work in Yukon; we will then pilot these over the summer. This project also provides funding for fish ageing for all samples available. Most of these are aged by a contractor.

**Nathan Millar,** Senior Fisheries Biologist

## Southern Lakes – Lake Trout Movement and Population Structure

This project will provide us with an understanding of the relative contribution of each of the interconnected Southern Lakes to lake trout harvest within them. By examining lake trout movement among the lakes, using telemetry, and relating movement behaviour back to sub-population structure using genetic information, we can partition lake trout harvest within the Southern Lakes to lake-specific production of lake trout. Using this information, we can assess sustainability of lake trout harvest throughout the interconnected Southern Lakes, providing a basis for effective management of these stocks.

### Project Description: What we're going to do

This project will involve tracking movement of lake trout within the interconnected Southern Lakes (Marsh, Tagish, Nares, Bennett, Atlin) using autonomous telemetry receivers stationed between the lakes, and transmitters implanted in lake trout. Using genetic material from tagged trout, as well as current and archival material from trout sampled throughout the Southern Lakes, we will allow be able to assign multi-year, inter-lake migration behaviour to specific sub-populations.

This opportunity to examine lake trout movement and population dynamics emerged with the creation of a fund for fisheries management and conservation in the Bennett Lake area. This is a multi-year project, with a gradual scaling-up approach to allow for adaptive responses to arising challenges and opportunities.

### Management Implications: Why we're doing it

Effective management of lake trout within the interconnected Southern Lakes requires an understanding of the contribution of each lake to the system-wide lake trout population. Without this understanding, assigning harvest pressure at specific locations to different sub-populations within the lakes cannot be accomplished, and overharvest of these sub-populations cannot be assessed reliably. As a result, we encounter difficulties in determining the sustainability of Southern Lakes lake trout harvest.

Bennett, Nares, Windy Arm, Tagish, Marsh and Atlin lakes are all closely connected by large rivers that allow fish to readily migrate between water bodies. Movement of lake trout among these lakes is apparent, through both local and traditional knowledge, and past tagging studies. Both the interconnected Southern Lakes and the rivers that connect them are popular and productive destinations for anglers seeking lake trout.

## Project Activities: How we'll get it done

This year, our activities will consist of data downloading and maintenance of an autonomous receiver array, deployment of further transmitter tags in lake trout, collection and analysis of genetic material from the recreational, subsistence and commercial fishery, and identification of spawning areas used by transmittered fish. In the spring we will download and analyze the data recorded by the autonomous receivers. We will also deploy transmitters in lake trout captured as they migrate through the Six-Mile (10 transmitters) and Nares (10 transmitters) rivers. In the summer, we will deploy transmitters in lake trout captured in Tagish (10 transmitters) and Bennett (10 transmitters) lakes, as well as collect genetic samples from Southern Lakes fisheries (recreational, subsistence and commercial). In the fall we will use transmittered fish to identify new spawning locations and we may deploy additional 5 – 10 transmitters, primarily in Bennett Lake, where we currently lack data on spawning locations.

An angler harvest survey and SPIN survey on one of the Southern Lakes (as part of a 3-year program aimed at completing these surveys for Tagish, Marsh and Bennett lakes) will provide further information on sub-population abundance, harvest, genetic identity and spatial distribution of Southern Lakes lake trout.

**Oliver Barker,** Fisheries Management Biologist

## Bat Monitoring and Conservation

Little Brown Bats are now deemed *Endangered in Canada* because of the threat posed by an emerging disease: White-Nose Syndrome (WNS). WNS is spreading westward and has already devastated populations in north-eastern North America. This project will help us establish baseline information from which to assess the pending impact of this disease.

### Project Description: What we're going to do

This project monitors changes in the diversity and abundance of Yukon bats. We are developing innovative methods for monitoring Little Brown Bats that have the potential to be used for similar bat monitoring programs elsewhere in Canada and Alaska.

By focusing our efforts in YG campgrounds, the project also has the potential to highlight natural pest (mosquito) control in campgrounds, alleviate problems with bats in picnic shelters, and provide wildlife viewing opportunities.

### Management Implications: Why we're doing it

It is predicted that WNS has the potential to cause the virtual extinction of the Little Brown Bat within 10-15 years. This bat was by far the most numerous bat species in Canada, and plays a key role in regulating nocturnal insects, including pests, in the boreal forest.

This project is being conducted to monitor the status of species at risk in Yukon, with a focus on documenting population change and providing that information to the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and other assessment bodies (e.g. general status, NatureServe). It has been designed to link to similar projects being conducted elsewhere, making our data comparable on a continental scale. The information will also be useful for developing national (or territorial) recovery strategies for these species, as required under the federal Species at Risk Act.

### Project Activities: How we'll get it done

We will continue to band and monitor bat populations at bat houses erected in southern and central Yukon, primarily in or adjacent to YG campgrounds. Field work will occur on about 12-15 nights from May to September. We will capture bats as they exit from the bat houses, and then measure, band, assess them for reproductive state before releasing them. We will use mark-recapture techniques to:

- conduct a population census of the colonies;
- calculate productivity (proportion of pups born); and

- calculate adult survival (number of previously marked bats returning the following spring).

In addition, we will monitor the relative abundance of bats on the landscape, through a pilot study. This entails using bat detectors to monitor for bat activity in a small grid near Whitehorse. Then, using new statistical methods, we will estimate occupancy rates which will provide a proxy for relative abundance on the landscape.

One or more wildlife viewing events will be scheduled in relation to our project activities, and media inquiries will be responded to, where applicable.

**Thomas Jung**, Senior Wildlife Biologist (Biodiversity)

## Ground Squirrel Assessment

This project looks to examine the status of ground squirrels in southern Yukon.

### Project Description: What we're going to do

We will census and monitor select ground squirrel colonies near Whitehorse to develop a population estimate and to determine overwinter survival.

### Management Implications: Why we're doing it

Ground squirrels are of very high importance to local First Nations, and monitoring their populations contributes to implementing the recommendations of the Southern Lakes Wildlife Coordinating Committee's Regional Wildlife Assessment.

Ground squirrels are a keystone species in alpine tundra ecosystems that may also be impacted by climate change. Recent research in southwestern Yukon has highlighted that ground squirrel populations may be in decline, particularly in lowland boreal forest. In alpine areas, climate change and changes in the predator community pose a significant threat to colonies.

### Project Activities: How we'll get it done

We will work with the University of British Columbia to use non-invasive techniques to determine colony sizes between Kluane Lake and Whitehorse. These data would then be used to develop models aimed at examining factors affecting colony occupancy in Yukon.

This is the second of a 3-4 year cooperative study with the University of British Columbia.

**Thomas Jung**, Senior Wildlife Biologist (Biodiversity)

## Gyrfalcon Inventory and Monitoring

This project tracks the occupancy and productivity of gyrfalcons in the Coast Mountains. Gyrfalcons are rare in the Coast Mountains of Yukon and British Columbia, and they demonstrate marked annual variation in their reproductive output.

### Project Description: What we're going to do

This monitoring project will examine the productivity of selected nest sites in the Southern Lakes region, contributing to the existing long-term data for this species in the region. This is Year 13 of this longer-term monitoring initiative.

### Management Implications: Why we're doing it

The gyrfalcon monitoring program ensures Yukon meets national and international obligations for this *Convention on International Trade in Endangered Species* (CITES) of Wild Fauna and Flora species, and supports cooperative management of falcons with B.C. through the BC/ Yukon Accord. Additionally, nest occupancy and productivity data can also be used for status assessments and a Non-Detrimental Finding for CITES, if necessary.

This population has reached a previously unrecorded low, likely due to ptarmigan population cycle failure. Survey results are shared with British Columbia and others to inform the joint management of this trans-boundary population.

### Project Activities: How we'll get it done

This is a cooperative monitoring project with Yukon Parks Branch, with in-kind support in the past received from Yukon College. In June 2014 we will conduct a 1-day aerial survey of known gyrfalcon nesting territories in the Coast Mountains, including portions of Kusawa Territorial Park, to monitor for occupancy of territories by nesting pairs, and their reproductive output (the number of chicks in the nests).

**Thomas Jung**, Senior Wildlife Biologist (Biodiversity)

## Impact of Climate Change on Snowshoe Hare Survival

In this cooperative study, we are examining how snowshoe hare adapt to rapid changes in the timing and duration of snow cover. Snowshoe hare are a keystone species in Yukon's boreal forest. Climate changes that impact snowshoe hare may greatly affect how animal communities in the area function, with possible impacts on key furbearers such as lynx and wolverine.

### Project Description: What we're going to do

We will monitor a small sample of snowshoe hares to note the variation in changes in coat colour in relation to snow conditions, and their survival. A companion study is being conducted at a more southerly location (Montana).

### Management Implications: Why we're doing it

Understanding the snowshoe hare's ability or limitation to adapt to climate change allows communities and wildlife managers to better understand the potential impact on trappers' livelihood and lifestyle. Snowshoe hare are pivotal to the maintenance and functioning of boreal forests and this study describes some possible impacts from changing snow arrival and melt periods on their population and reproductive success.

### Project Activities: How we'll get it done

Up to 30 snowshoe hare are captured and radio-collared in early spring (April) near Kluane Lake and they are monitored by radio-telemetry to note their survival, in relation to coat colour and snow conditions.

This is the third of a four-five year cooperative study with the University of British Columbia and the University of Toronto. The bulk of the work is being carried out by our university partners.

**Thomas Jung**, Senior Wildlife Biologist (Biodiversity)

## Keystone Boreal Species Trend Monitoring

Tracking population trends in small mammals and snowshoe hares provides an early warning of change to the natural environment and contributes to understanding the resilience and vulnerabilities of Yukon's boreal forest food web. Understanding the natural year-to-year variations is a foundation from which we can discuss and describe trends and monitor any emerging issues in these populations that could in turn possibly affect harvested species.

### Project Description: What we're going to do

The project, currently under review, has been an annual monitoring program based on the established long term studies in the Kluane region and is anticipated to include Mayo, Watson Lake, Faro, Whitehorse, and Burwash. Monitoring involves the collection of traditional and local ecological knowledge as well as scientific measures.

Keystone species of the boreal forest food web are assessed for annual populations and productivity using standardized methods across a network of sites in Yukon. The data we collect is analyzed for trends on annual productivity, keystone species population trends, and changes in furbearer species density. The central database is continually updated and includes local knowledge on environmental conditions.

### Management Implications: Why we're doing it

Long-term monitoring of the key components of the boreal forest food web can provide baseline data for understanding both long-term change and other, direct, land use effects. These effects can have management implications (given notable changes or trends). The results of monitoring programs may help explain variation in cycles of hare, small mammals, and furbearers

Monitoring carried out within the framework of adaptive management can show how well management actions are working and ultimately may reduce the risk of long-term detrimental ecological effects.

### Project Activities: How we'll get it done

Collecting information about ecological baselines and variation is most informative if done annually. During the summer, we will use consistent methods on our existing standardized monitoring sites to measure the key boreal food web components— mice, vole, and snowshoe hare populations as well as annual productivity of ground berries, spruce cones and mushrooms.

We will also continue monitoring the abundance of small and medium-sized carnivores using track counts in select communities during the following winter.

**Todd Powell**, Manager, Biodiversity Section

## Species at Risk Management

This project delivers Species at Risk programs that meet Yukon government objectives and requirements in National/Provincial/Territorial Agreements, such as the National Accord for the Protection of Species at Risk, COSEWIC, RENEW, and CITES. Emphasis is on species of particular importance to Yukoners, such as grizzly bears, polar bears, caribou, and bison.

### Project Description: What we're going to do

These activities involve the coordination and delivery of species at risk status assessments at the territorial, national and international level, through the national general status assessment program and COSEWIC (Committee on the Status of Endangered Wildlife in Canada), as well as participation on national expert working groups for species at risk (such as recovery planning teams).

It also supports Yukon's representation in national and international forums and committees for species at risk concerns, coordinating management and investigations with regional and species programs staff, and addressing topics of public and political concern as they arise.

### Management Implications: Why we're doing it

These activities support our ability to identify and manage for species at risk in Yukon, as per the *National Accord for the Protection of Species at Risk*, and in conjunction with federal activities under their *Species at Risk Act*, such as management planning for species such as bison, caribou, bats, and bears. Participation in national forums on species at risk affords us the opportunity of having our views and opinions on the status and management of Yukon wildlife being taken into account at the national level.

### Project Activities: How we'll get it done

We will participate in national species at risk forums (COSEWIC, RENEW, General Status, CITES) through ongoing discussions and attendance at required meetings. We will provide lead technical representation on management planning for Yukon species at risk via national species at risk teams for key species (e.g. bison, polar bears). Activities will include reviewing territorial general status and NatureServe ranks for vertebrate species (mammals, freshwater fish, resident birds, and raptors) and contributing to the national ranking processes done by the General Status of Wildlife Species Working Group.

**Thomas Jung**, Senior Wildlife Biologist (Biodiversity)

## Wolverine Carcass Collection

Besides being a species at risk, wolverines are also an important furbearer. Yukon trappers harvest about 100 to 150 wolverine each year and the carcasses are valuable for learning about the harvest of this species, as well as aspects of its population ecology. Information from the carcass collection program will be used to assess the sustainability of the harvest.

### Project Description: What we're going to do

We collaborate with Yukon trappers and the Animal Health Unit to collect wolverine carcasses and necropsy them to collect age, sex, and reproductive data, as well as obtain biological samples for diet studies and disease testing. Our experience is that we can obtain about two-thirds of the wolverine harvested by trappers.

This project provides an opportunity to explore and assess how we might be able to better use biological submissions to determine population status and inform harvest management. Use of biological submissions is a cost-effective means of collecting valuable data that can be used in a management context.

### Management Implications: Why we're doing it

Wolverine are assessed as a Species at Risk in Canada by COSEWIC (Committee on the Status of Endangered Wildlife in Canada), and are also considered globally at-risk. We anticipate that wolverine will soon be listed on the federal *Species at Risk Act* and a management plan will need to be developed. If necessary, information from this project can be used for a Non-Detrimental Finding for CITES, indicating whether our harvest management practices do not threaten wolverine populations.

Similar wolverine carcass collection projects occur in the NWT and Nunavut, and there is a potential to share information across all 3 territories and compare results.

This project is aimed at assessing the sustainability of the harvest using a new method that relies on mandatory or voluntary biological submissions rather than field work.

### Project Activities: How we'll get it done

Trappers are asked to voluntarily submit skinned wolverine carcasses from their concession. Carcasses are kept frozen until April or May, when they are necropsied and biological samples are collected. We determine the sex and collect a tooth for aging at a commercial lab. Reproduction of females is examined in the lab, and stomachs are collected and sent to Laurentian University for diet analyses. Various samples are collected to test for specific diseases of interest, such as rabies and trichinosis at labs outside the territory.

Age and sex data are used to describe the harvest for a given year. Once an adequate number of years of data are available we can then begin to develop population models to retrospectively determine if the harvest is sustainable.

**Thomas Jung**, Senior Wildlife Biologist (Biodiversity)

## Yukon Conservation Data Centre (CDC)

The Yukon Conservation Data Centre (CDC) is part of an international network and is the primary body responsible for supporting status rankings for all species in Yukon. Collected information is critical for land-use planning, environmental assessments, and to meet the obligations of agreements including the *Canadian Biodiversity Strategy* and the *National Accord for the Protection of Species at Risk.*

### Project Description: What we're going to do

Yukon CDC's role is to gather, maintain, and distribute information on wildlife and ecological communities of conservation concern in the territory, and coordinate assessments to determine conservation status for all Yukon species. The Yukon CDC's database currently lists and tracks information on the locations and conditions of 346 species of conservation concern in Yukon. The Yukon CDC also produces materials and hosts workshops designed to help people learn about species of conservation concern.

### Management Implications: Why we're doing it

By providing information on rare species and ecosystems the Yukon CDC supports agencies involved with land-use planning, species at risk recovery planning, environmental impact assessments and meets national and international agreements, plans, or strategies.

### Project Activities: How we'll get it done

This on-going project is the central source for Yukon's rare species and ecosystem data. We will continue to collect data from multiple sources and serve as a point of contact for the public and government for information related to rare or at-risk species in Yukon.

We assign and update conservation ranks for all Yukon species and play a proactive role in identification of rare elements (plants, animals, lichens, and ecosystems) and their conservation. This will feed directly into general status reporting of species of conservation concern.

- Continue to add information about rare species to the YCDC's database;
- Update the conservation ranks of plant, lichen and animal species in the database, concentrating on those that are globally and nationally of conservation concern;

- Publish outreach materials (updating Yukon Species at Risk booklet, species information sheets for field identification, and Watch and Track lists) in collaboration with other departments;
- Provide ongoing support the national General Status ranking process; and
- Provide an annual activities report detailing database changes, extension and information material updates as well as recommendations.

**Bruce Bennett,** Coordinator Yukon CDC